RAILROAD GAZETTE

SATURDAY, SEPTEMBER 28, 1872.

Hornig's Patent Shear and Punching Machines.

The following machines, which have gained high approval and success, were designed and the movement patented by Julius L. Hornig, the patent having been granted February 7, 1865, and reissued November 9, 1869. They are designed principally for the purpose of shearing, punching, slotting or bending (straightening) metal bars, rails or plates.

As a double machine it is shown in engraving No. 1. The double-bar shears, it is evident, will require only a small amount more iron in their construction than a single-lever shear of the same strength, and must be proportionately cheaper.

The compactness, ease of access to every part, disposition of iron to best advantage in strength of parts, and their arrangement above ground, forming a compact, complete machine in itself, particularly when for driving power a steam engine, as shown in engraving, is attached to the machine, show clearly how conveniently men can handle and pass the bars all around the shears, which may be moved and placed on any floor strong enough to support their weight, and may be operated by connecting steam-pipes to the engine. Where shafting is provided and convenient, a driving pulley in place of seam engine is furnished.

The prominent features of these machines are the lever movements and connections with the operating eccentric. Each lever vibrates on its own rock-shaft or fulcrum pin, which is securely keyed in the massive frame. These levers are driven by an eccentric, against which they bear at their upper ends, which are shaped to form a segmental large face remaining in constant contact with the eccentric, transmitting the power, while the center of such segment furnishes the mathematically correct fulcrum for the attachment of an eccentric strap which takes no portion of the strain, but is simply used to draw or hold the levers back against the face of the eccentric, ready to receive its impulse. Engraving No. 1 shows these levers provided with shear knives and the frame provided with jaws with similar stationary knives, operating like the customary lever-bar shears, but constructed as upright levers, where the weight of such levers is so placed in relation to the lever fulcrum that it aids partly while the cutting is done, the strap pulling it back with the eccentric, so that the power of operating is most uniform and the moving parts relatively counterbalanced. This lever connection also enables these machines to be operated at any desired speed without jumping the lever or jarring.

The eccentric and its shaft is provided with a gear, which receives its motion through a pinion on the driving-shaft, which is provided with a fly-wheel projecting on one side of the frame, while on the other side of the frame the attached driving-pulley or crank with engine connection provides the driving motion.

Engraving No. 2, an end view of plate shears, shows the lever operating by means of a projecting strong, tooth-shaped part, in a horizontal position to the lever fulcrum, a suitable slide-block being provided with a shear knife, guided in a frame for vertical motion. The frame is shaped to form a jaw, holding a suitable stationary knife, and it forms by this construction a plate shear or shear for continuous cutting. Such a slide-block employed to hold punching or slotting tools, instead of a shear knife, and the frame jaws constructed to hold punching-dies make this machine a punching or slotting machine. The slide block provided with a presshead, and the frame jaw with suitable die will serve as a moulding press, or, with suitably arranged bearings on the frame, as a bending or straightening machine.

To suit different applications, these machines have been constructed mostly as double machines, where both levers operate as bar-shears; or one lever is used for bar-shearing and the other for plate-shearing or for punching, and such combinations of the two as may be desired combined in one machine.

Engraving No. 3 shows a double machine, in which one lever operates a punch for rails, while the other lever operates a slotting tool for rails, as shown in engraving No. 4. In machines like these rail-punching and slotting machines, where interruption of operation, in punching, for instance, is desirable without stopping the running of the machine, the crosshead or slideblock has an open space equal to the throw of the sliding-in piece," or block of metal, is shoved in the space by a hand-lever arrangement, as shown in the engravings No. 3 and No. 4, when the slideblock is consequently moved and operates.

An adjustable stop arrangement is also provided on punching machines to lower the slideblock with the punching-tool to the surface of the metal to be punched, while the filling-in piece is removed, to adjust the metal if marked to the correct position before punching.

Suitable guards and guides for shearing to length or size are conveniently attached to these machines. The levers of all these machines are made their weakest part, so that in case of breakage the only delay is in disconnecting the broken lever from the eccentric. The machine keeps the remaining lever in operation, and a lever is replaced with the least expense or delay. Such a provision is appreciated in establishments where the interruption by breakage of single machines causes the stoppage of entire departments.

Engraving No. 5 shows the construction of a rail-straightening machine as a single-lever machine. These machines were first designed and constructed as shears for the Troy Iron Works, where they proved very advantageous, and became so favorably known that the patentee was requested by other iron manufacturers to construct machines on the same principle and patent for the different adaptations mentioned before. As significant of the appreciation in which they are held, we may mention that the Iron Works in Milwaukee, Chicago, Detroit and Hamilton, Ont., known as Capt. Ward's mills were the first in the Western States to order these double machines about five years ago, and now have nine machines in operation and two additional under construction. Other prominent works, which use such tools constantly and are likely to be very careful to get what will serve them best, have provided themselves with one or another of these, as may be seen by the following list of some of those which now have them:

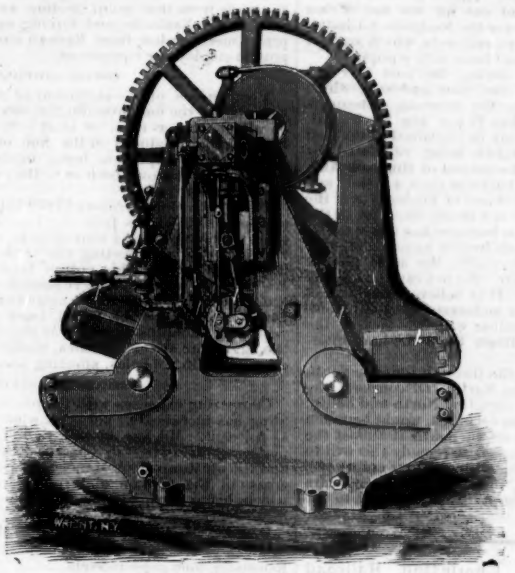
The combined rail punch and slotting machine is in operation at the Milwaukee Rolling Mill, Milwaukee; Chicago & Northwestern Railway, Chicago; Illinois Central Railroad, Centralia and Amboy, Ill.; Milwaukee & St. Paul Railway, Watertown, Wis.; Joliet Rolling Mills, Joliet, Ill.; Decatur Rolling Mills, Decatur, Ill.; La Grange Rolling Mills, La Grange, Mo.; Evansville Rolling Mills, Evansville, Ind.

The rail-straigthening machine is employed at the La Grange Rolling Mills, and the Evansville Rolling Mill.

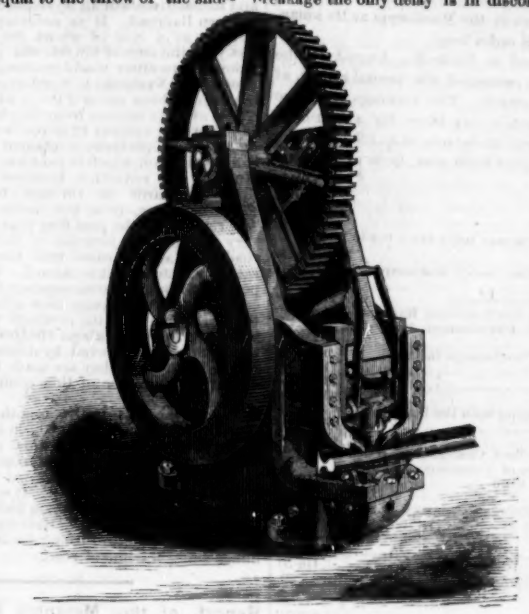
The double hot-shears are used at the Milwaukee, Indianapolis, North Chicago, Hamilton and Wyandotte (Mich.) rolling mills.

The shears and punching machines for various services are in operation at the Milwaukee Rolling Mill; the Ontario Iron Works, Oswego, N. Y.; Troy Iron Works; American Tool Steel Works, Brooklyn; one built for the Chicago Steel Works at Detroit; Chicago & Rock Island Railroad, Chicago; New York Central Railroad, Albany; Schenectady Locomotive Works; American Bridge Company's Works, Chicago; Kellogg's Chain Works, Oswego, N. Y.; Wyandotte (Michigan) Rolling Mill; Atlantic Steel Works, Brooklyn; Canda's Car Manufactory, Chicago; Northern Pacific Railroad, St. Paul.

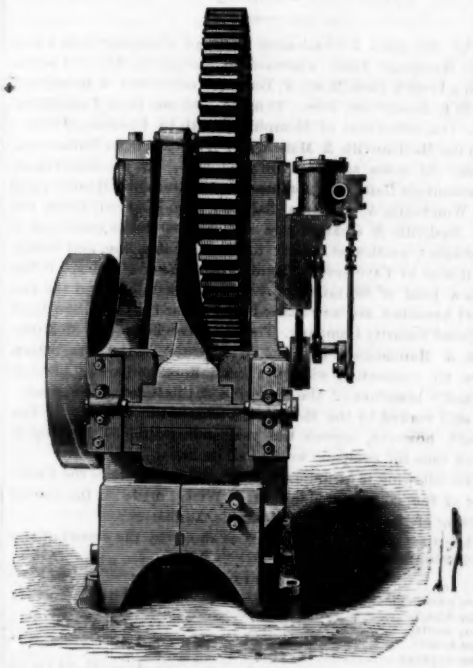
Three sizes of such machines for heavy manufacturing service have been introduced and are manufactured by Elmes & Son, Columbian Works, Chicago, and by Paulding, Kemble & Co., West Point Foundry, New York, who supply orders. In consequence of the satisfaction these machines give in service, the patentee, an engineer of unusual ability and ingenuity, is now designing single lever machines on the same principle and patent for light or hand-power service, to compete with the light machinery so much in demand for sheet-metal work. Mr. Julius L. Hornig, the patentee, may be addressed care of above named manufacturers.



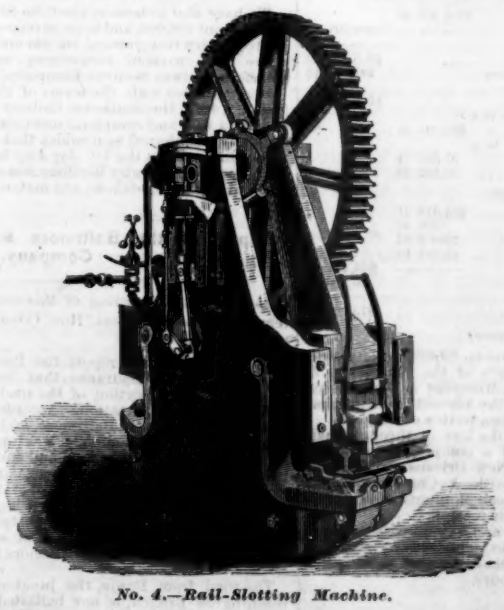
No. 1.—Double-Bar Shears.



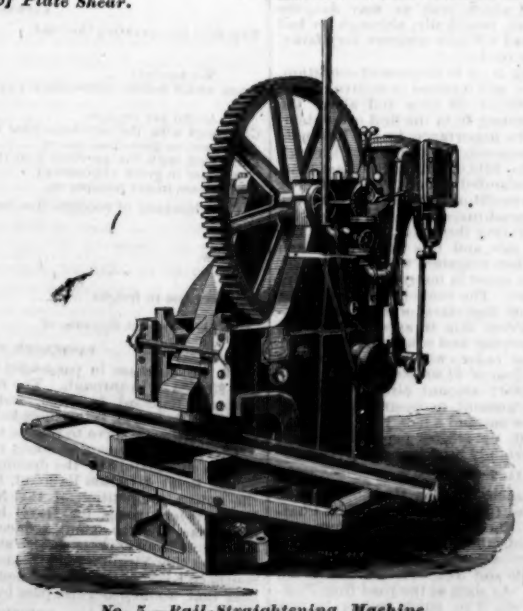
No. 3.—Rail-Punching Machine.



No. 2.—End View of Plate Shear.



No. 4.—Rail-Slotting Machine.



No. 5.—Rail-Straightening Machine.

Mr. John K. Bennett, Assistant Superintendent the Pullman Palace Car Company at Chicago, was married last week to Miss Emma A. Albee, of Aurora, Ill.

Report of the Nashville & Chattanooga Railroad Company.

The Nashville & Chattanooga Railroad Company owns the main line from Nashville to Chattanooga, Tenn., 151 miles; a branch from War Trace (56 miles southeast of Nashville) southwest to Shelbyville, 8 miles, and a branch from Bridgeport, Ala., (133 miles southeast of Nashville) northeast to Jasper, Tenn., 14 miles. It thus has 173 miles of road.

The Nashville, Memphis & St. Louis Railroad (late Nashville & Northwestern), which is now substantially owned by this company, extends from Nashville west to Huntingdon, Tenn., 109 miles, and thence northwest to the Mississippi at Hickman, Ky., 63½ miles, being thus 172½ miles long.

At the annual meeting held in Nashville, August 14, the President, Colonel E. W. Cole, presented his annual report, of which the following is an abstract. The earnings are at the rate of $10,408 per mile, which is very large for a Southern railroad. The net earnings were at the rate of $3,136 per mile:

The gross earnings for the past fiscal year, from passengers, freight and mail have been	$1 850,757 70
Total expenses	1,358,264 93
Net income	$542,492 77

But of this the following payments have been made:

Interest on company's bonds	$103,860 00
$23,700 on State loan, paid in State bonds and coupons, cost	14,220 00
Interest on bonds paid to U. S. Government	40,000 00
Interest on bonds of Nashville & Northwestern Railroad, endorsed by the Nashville & Chattanooga Railroad Company	2 400 00
Damages on account of flood at Chattanooga in 1867	9.275 66
Capital stock bought in	1,319 62
Real estate and depot grounds	23.720 54
For locomotive engines	105,288 24
Expenses and lawyers' fee in settling with the U. S. Government claim	27,000 00
For new bridges	64,485 55
27 bonds on hand of the Nashville & Chattanooga Railroad Company; 22 of the State of Tennessee, and 3 of the City of Memphis bonds on hand	35.812 20
Old dividends paid	1,068 06
Stock in Edenfield & Kentucky Railroad Company, cost	165 00
6 per cent. dividend on $2,021,373 30	121,294 40
Total expenditures	$547 909 27
Amount overpaid	5,416 50

LIABILITIES CREDITED.

For new railroad iron	$80.745 25
For new bridges	72,668 74
Real estate and depot grounds	19,250 00
Total new liabilities	$182,663 99

COMPARATIVE INCREASE AND DECREASE.

The large increase of $434,821.45 in receipts of freight last year over the year previous, is as gratifying to the directors as they trust it will be satisfactory to the stockholders.

The falling off in passenger earnings, and from rents and privileges is the experience of all principal railroads in the South; which leads to the conclusion that scarcity of money was the principal cause of this falling off.

NASHVILLE & NORTHWESTERN RAILROAD.

This road, now purchased and operated by the Nashville & Chattanooga Railroad Company, shows the earnings from freight, passage, etc., to be $616,329.78. During the same time the following payments have been made on account of operating this road, renewing the track and bridges, purchasing equipments, etc:

Track and bridges	$198 193 87
Motive power	170 872 87
Maintenance of cars	81.083 90
Conducting transportation	132,297 61
Miscellaneous	24,703 72
New bridges	37,880 69
New iron rails and fastenings	118,451 16
Pile driving on the road and at Hickman	13,499 58
New cars	64,925 00
New locomotives	10,647 55
Depot grounds and right of way	16,155 38
Account of purchase of road	23,370 95
Interest and exchange	18,790 58
Damages at Harpeth River	72,653 89
Total	$983,526 55

The notes of the company with interest have been given for these amounts, falling due at different dates in the next twelve months, to which will be added $21,240, the cost of the "iron draw" in the Tennessee River bridge at Johnsonville. This work will not be completed before about the first of October, and to be paid for, by contract, in three equal installments at six, twelve and eighteen months, from completion of work, at 8 per cent. interest per annum.

The earnings of this road increased over the year 1869–70 $200,240.01, and over the year 1868–69 to the amount of $362,295.26, from the beginning of which year we may date the opening of this road for business, practically, although in bad condition at that time. The road will now compare very favorably with most of the Southern roads.

To operate this road and bring it up to its present condition, adding the amount paid for cars, and increase in motive power, depot grounds, etc., has cost $831,927.50 over and above the earnings received from it, counting from the first of September, 1868, date of first lease. Its importance to the Nashville & Chattanooga Railroad as a connection is shown by the through freight business, amounting to $243,063.91 for the last year, while for the year previous it amounted to only $75,178.64.

The Commissioners allowed a credit of $700,000 in Tennessee bonds, on the purchase, for expenditures made and losses sustained by your company in operating the road, under the two agreements of lease to date of sale, and this compromise and settlement was deemed better than litigation with the State.

The sum of $375,000 has been spent in improving and equipping the road since the purchase. The sum of $500,000 will be required to finish the track in first-class order, fillings improved, embankments, etc. From this it appears that the amount necessary to finish renewing and equipping the road, and putting everything in good order, will involve a cost of about the following: Average cost of $2,400,000 of Tennessee State bonds at 67 cents, $1,608,000; amount already expended since the purchase, $375,000; amount necessary to complete and equip, $500,000; interest for one and a half year, say $217,000; cost in money, $2,700,000, or $15,789 per mile, which, furnished and equipped, will certainly be a very cheap road.

HUNTINGDON & JACKSON BRANCH.

The construction of the branch between Huntingdon and Jackson was postponed until the title of the Nashville & Chattanooga Railroad Company to the Nashville & Northwestern road could be clearly established, about which there is now no doubt. This will give the shortest route, *via* the Nashville & Northwestern Railroad, to Mobile and New Orleans, and much the shortest route to Memphis. As soon as the road from Jackson to Memphis is built, about which so much feeling is now exhibited in that section, it will also open up a rich section of country to the trade of Nashville, which now goes to other rival cities. It may become necessary to build a short railroad from opposite Hickman to Charleston, Missouri, or to some point near that place on the St. Louis & Iron Mountain Railroad, reducing thereby the distance to St. Louis fifteen miles, leaving the Nashville & Northwestern road near its crossing of the State line of Kentucky, and extending to Columbus, Ky. This new road and connection is contemplated because the officers are not satisfied that the managers of the Mobile & Ohio Railroad will give the road such facilities as the growing importance of the Northwestern Railroad line will demand.

To afford greater facilities for the movement of freight over the roads, the directors have contracted for seven new freight locomotives—six-wheel drivers—to be delivered between the 1st of October and the 1st of January, at a cost of $110,000, and have arranged for building 300 box cars in the company's shops during the year, which will cost about $225,000. These cars and locomotives will all be required for the Nashville & Northwestern Railroad. It is contemplated to order 100 additional box cars at a cost of about $80,000. This is necessary, since last year the sum of $70,000 was paid out for the use of cars belonging to other roads running over the Nashville & Chattanooga, and Nashville & Northwestern railroads, which amount might have been saved if the road had been fully equipped.

The average income from freight during the past year was $2.78 per ton, against $3.40 per ton the year previous, which difference is partially explained by the increase of tonnage from coal, upon which is paid less than $1 per ton for freight. Much of this reduction, however, may be explained in the fact that the tariff on through freights being regulated by *competing* lines, it is not under the control of this company. The reports for the past four years' business show a steady and very satisfactory increase in the volume of business over the road, but at the same time there is a steady decrease in the rate at which freight is carried. The tonnage has increased 75 per cent., and the gross earnings from freight increased 45 per cent. Had the company been able to realize the same pay for the work done as in the previous year, the net earnings would have been increased about $100,000. It is believed this state of things may be improved by a better understanding with competing lines, when they are made familiar with the fact of the damaging character of this competition to all the lines interested.

During the last twelve months the through tonnage South was 289,769 tons, against 39,660 tons North. Of course if the business of the road was divided in direction North and South, the net profits, in proportion to gross earnings, would be much more, as empty cars are returned from the South at almost the cost of hauling loaded ones. It is hoped to remedy this evil to some extent by insisting upon loading with coal our empty box cars returning from Chattanooga, instead of using coal cars for that trade, and returning them empty from Nashville to the mines along the line of road.

Report of the Memphis & Charleston Railroad Company.

The Memphis & Charleston Railroad Company runs a line from Memphis, Tenn., eastward to Stevenson, Ala., 271 miles, with a branch from Moscow, Tenn. (39 miles east of Memphis) north to Somerville, Tenn., 13 miles, and one from Tuscumbia, Ala. (145 miles east of Memphis), south to Florence, 6 miles; also the McMinnville & Manchester Railroad from Tullahoma, Tenn. (69 miles southeast of Nashville, on the Nashville & Chattanooga Railroad), northeast to McMinnville, 34 miles; and the Winchester & Alabama Railroad, from Decherd, Tenn. (on the Nashville & Chattanooga Railroad, 80 miles southeast of Nashville), southwest nearly to the Alabama line, and thence northwest to Fayetteville, Tenn, a distance of 44 miles. It has thus a total of 368 miles of road. Its main line and the two short branches are now leased and worked by the Southern Railroad Security Company. The other two lines—the McMinnville & Manchester, and the Winchester & Alabama, which have no connection with the main line, and are at present virtually branches of the Nashville & Chattanooga Railroad—are still worked by the Memphis & Charleston Company. The report, however, covers the year ending June 30, 1872, up to which time the company worked all its lines.

The following is a summary of the annual report of the President of the company, Major M. J. Wicks, made at the annual meeting of shareholders in Memphis, August 28:

The gross receipts of the road, as shown by the report of the Superintendent, herewith submitted, were:

RECEIPTS.

From passengers	$631,423 01	
From freight	679,009 26	
From mails	44,684 99	
From rents	38,451 99	
From express	33,547 78	
		$1,404,116 02

EXPENSES.

Expenses for operating the road	$950,391 69	
		950,391 69
Net receipts		$453,724 33
From which deduct extraordinary expenses		197,057 13
Actual net receipts		$256,667 20
Compared with the previous year there is a decrease in gross receipts of	$13,325 44	
Compared with the previous year there is a decrease in gross expenses of	51,557 74	
An increase in net receipts of	38,232 30	

This decrease of receipts has been in—

Passage	$34,910 21	
Mails	206 25	
Express	13,452 22	
Rents	15,583 10	
		$64,151 78
Less increase in freight		50,826 34
Showing net decrease of		$13,325 44

PASSENGER BUSINESS.

Of the decrease in passenger business, $9,669.31 is in local, and $38,584.35 in through. The receipts of the Winchester & Alabama Railroad, $6,527.00, and McMinnville & Manchester Railroad, $6,816.45, being included in the amount of entire passenger business, serve to reduce the loss to this extent.

There is little reason to doubt that the loss in through business is due mainly to the opening of a competing route, via Selma, Rome & Dalton Railroad, for New Orleans travel, while the active competition of the Nashville & Chattanooga and Northwestern roads for travel between Memphis and Chattanooga has, to some extent, reduced our receipts.

Receipts from express service show a heavy decrease, resulting from the Virginia road having no arrangement with the Southern Express Company, forcing that business over other lines that would otherwise pass over ours.

FREIGHTS.

Our connections have supplied cars to a greater extent than heretofore for the joint through traffic, reducing our car rents very materially, and cutting off greatly the revenue from earnings of our cars in their service.

Freight shows an increase of	$50,826 34
From this, however, should be deducted:	
Receipts of the Winchester & Alabama Railroad	$12,249 72
Receipts of the McMinnville & Manchester Railroad	7,856 05
	20,105 77
Leaving increase of this business on Memphis & Charleston Railroad	$30,720 57

of which $9,572.65 is local, and $21,147.92 through business.

Our through freight tonnage has increased largely in excess of increased earnings, owing to the low rates prevailing, consequent upon active competition. We were cut off from St. Louis during the best shipping season on account of low water in the fall, and the river being closed by ice during the winter, the trade from that point finding an outlet entirely by the all rail line *via* Nashville, and forcing us to depend wholly on low priced merchandise from Eastern cities and cotton from Memphis to employ our equipment.

COTTON SHIPMENTS.

A comparison of the statement of cotton shipped this year, with that of the one preceding, shows a decrease of 9,689 bales, or about 11 per cent. of local cotton, and that nearly 6,000 bales of that produced on the line of road found a market in New Orleans, shipments being made *via* Grand Junction, reducing our revenue both as to the carriage of the staple and the returning trade.

Through cotton increases 13,639 bales, notwithstanding a decrease of 11,955 bales from the line of the Mississippi Central road, depriving us of a considerable revenue from this loss directly, as well as affecting the trade we would otherwise have had returning, had this cotton been marketed at Memphis. We have, therefore, as before remarked, depended wholly upon the increased shipment of eastward bound cotton, in which there is shown to be 23,511 bales more than in the previous year from Memphis alone. Our shipments from this point in the aggregate are 89,236 bales, receipts being 66,046; the latter decreasing 15,920 bales, affecting materially our revenue.

COMPARATIVE STATEMENT.

Comparing expenses with the previous year, the cost of operating has increased 6¼ per cent., while gross expenses decreased 4½ per cent. Mileage of trains shows an increase of 23 7-10 per cent., due in part to operating the Winchester & Alabama and the McMinnville & Manchester roads, but mainly to an increase in the volume of through freight on the main line, which, being carried at low rates, does not give us an increase in receipts.

It has been shown that after providing for operating and extraordinary expenses, we had:

Remaining from gross receipts	$256,667 20
Amount of interest on bonded debt and interest and exchange account	304,067 92
Showing a deficit of	$ 47 400 72
Against a deficit of last year of	101,340 36

From the report of the Chief engineer, it will be seen that the large increase in extraordinary expenses in this department is due to the extensive renewals of iron, being largely in excess of our estimate last year.

Ordinary expenses also show an increase amounting to $17,080.15, arising mainly from replacing ties, fastenings and worn rails.

FINANCIAL CONDITION.

You are referred to the condensed balance sheet of the division treasurers for a full understanding of the financial condition of the company, cost of road, equipment and other particulars; also to the Treasurer's supplemental statement of 1st of August, showing your assets and liabilities, as well as receipts and expenses, since the close of the year. Your assets being estimated at real value are as follows:

Liabilities		$528,313 75
Of which at least $20,000 might be charged off, being old balances that will never be called for, and to retire the remainder we have the following assets at cash valuation:		
Stock in South & North Alabama Railroad, say	$6,000 00	
Stock in Shelby County Turnpike Company	3,000 00	
Stock in National Bank of Huntsville	8,000 00	
Hotel at Huntsville	6,000 00	
Bills receivable	20,000 00	
Sinking fund	1,000 00	
United States	5,000 00	
Post-office Department	20,000 00	
Due from railroads	5,000 00	
Due from agent	5,000 00	
Due from individuals	40,000 00	
Indorsed coupons	4,000 00	
Lands and lots	20,000 00	
Cash	22,000 00	
Total	$175,000 00	
Cost of Manchester & McMinnville and Sparta railroads	155,517 39	
		330,517 39
Total		$197,796 36

We have also a claim against the State of Tennessee amounting to about $90,000, and hope to recover of our claim against the United States Government an amount sufficient to pay off our entire debt without trespassing upon the rental from the Southern Railway Security Company.

In accordance with the terms of the lease, entered into on March 5, 1872, the Southern Railway Security Company, after making a full and complete inventory of the property of the company transferred to it under that agreement, assumed control of the road on the 1st day July last, since which they have been operating it under the direction of Captain Joseph Jacques, General Manager, without any material change in its organization.

Report of the Baltimore & Potomac Railroad Company.

At the annual meeting of this company in Baltimore, September 4, the President, Hon. Oden Bowie, presented the following report:

In the last annual report the President and directors gave the stockholders assurance that before the present yearly meeting a great portion of the road would be ready for travel and freight transportation. Accordingly on the second of July last the road between Baltimore and Washington, being thoroughly in order and complete, was opened to the public, and six trains were run daily then and since, each way, between the two cities. Two of these each way are accommodation trains, stopping for local benefits at all stations. The other four are mail and through trains, conveying Southern and Western travel, and stopping only at important stations. One of these is a night train, with the very best sleeping accommodations, and running through from Baltimore to Weldon without change of cars.

The road from Bowie, the junction of the main stem and Washington Branch, is now ballasted to Upper Marlboro', on the main stem, about fourteen miles from Bowie; the "turntable" at Marlboro' is now in, and as the want of this only has

for some time delayed that part of the road being opened, trains were yesterday started from that town. A gravel pit has been opened at Marlboro' to ballast that portion of the road south of the town; another has been purchased at Talbert's, a station about ten miles further south, and will be at once opened. Two others have been secured in Charles County to the Pope's Creek terminus, and as all our energies will now be directed to the immediate completion of the lower end of the route, along which there has been some complaint of delay, we can promise its opening to Pope's Creek by January 1, 1873. But reflection will satisfy even those who have complained most that we have exercised a sound policy in completing first the lines nearer Baltimore and Washington, which would give larger returns upon the heavy investment of the whole work. When completed, as it soon will be, it is our purpose to extend the greatest facilities and inducements for business along the whole line. We propose to run two trains daily each way between Bowie and Pope's Creek, connecting at the former place with Baltimore and Washington trains—one of which each way will be a fast and exclusively passenger train, and the other will be for freight, with passenger coaches attached.

While these very liberal facilities through a sparsely populated, and, of late years, because of the scarcity of labor, not very productive, country, may not pay the company at first, we consider it a wise economy and sound policy to build up a future paying trade by encouraging fruit and other culture and increasing business generally, the life-blood of railways. We hold that the wise course for all corporations, depending on the custom of others, is to invite business by the most liberal policy. This will embrace numerous stations along the line and as low rates as can be maintained. In this connection it must be remembered that the present rates of freight are only temporary upon a business which we are doing at great inconvenience and delay to the road, and only for the great and general accomodation of the people of the country through which it passes. It must also be remembered that the present charges for drayage in Baltimore will be very largely reduced when the completion tion of the tunnel will allow the delivery of freight at our regular depot instead of, as now, at a suburban station, some distance out of the city.

The last report having detailed so completely the character of the road, its grading, bridging, superstructure, etc., we deem it unnecessary to refer again to it, further than to say that the track of the entire length of the line is laid, the ballasting all completed, except from Marlboro' to Pope's Creek, and platforms and way station houses are being erected.

The equipment has been, like the construction, first-class in every respect. We have at this time: Passenger cars, the best made, 27; to arrive, 6; baggage cars, 10; box freight cars, 50; and to be delivered immediately, 50 more; gondola and flat cars, 125; hand cars for track and repair men, 22; truck cars for track and repair men, 22; engines now on hand, 16; ordered for immediate delivery, 5; and cattle cars ordered, 50.

Our line of road passing immediately by the State Cattle Scales, it is our purpose to give particular attention and the most liberal inducements to the cattle trade, which is already so large and greatly increasing each year in Baltimore. The obvious fact that our advantage of being able to unload cattle immediately in the State Yard would give to us this carrying trade from the grazing section of Virginia which passes through Washington has induced an effort, in the interest of another road, to require the cattle to be unloaded in Washington, under the pretence of being there fed and watered. But when it is remembered that the yard at Baltimore is less than two hours distant in time from Washington, and that Baltimore, being one of the largest home and distributing markets in the country, all cattle coming to the city are unloaded and refreshed here, it is unreasonable to suppose that this additional annoyance, expense and delay will be put upon drovers and dealers in Washington merely that another road, having less advantages than ours, should be benefited.

CONNECTION AND CONTRACT WITH THE SOUTHERN MARYLAND RAILROAD.

As we have labored earnestly for the success of our road so in the interest of Southern Maryland, which has been heretofore deprived of rail facilities, and of the cities of Baltimore and Washington, have we been gratified at the prospect of other roads being built from that part of the State to these cities; and been willing cordially to co-operate with any where the interests might be made identical, or were not too conflicting with ours.

Accordingly we have entered into articles of agreement with the Southern Maryland, a road chartered some years since by the Maryland Legislature, and running from Point Lookout through the counties of St. Mary's, Charles and Prince Georges, in the lower part of which last county it intersects our road, which, it is believed, will aid materially the building of this road, and upon its completion be materially advantageous to both.

The tunnel, a work of greater magnitude and expense than any of the kind in this country, except the Hoosac, is satisfactorily approaching completion, and we have the assurance of the contractor, Mr. Rutter, a gentleman of high character and great experience, that it will be completed by April next.

Thirty-seven hundred feet have been walled up, covered in and entirely finished. Rapid progress is being made with other excavations, which are enclosed as fast as each section is excavated.

The completion of the tunnel will complete our work, and facilities for local and through travel will then be unequaled. With the Union Tunnel connection, passengers from all sections of the country passing through Baltimore can do so without any change of car or delay, and for Baltimore travel the most enlarged facilities will be provided. Arrangements having been made with the Northern Central Railway for the use of its depot, as a starting point, in the heart of the city, excellent local stations—such as that at Lafayette, which will be continued, and to the neighborhood of all of which the city horse cars will run—will be provided at Pennsylvania avenue and at the State Cattle Scales on Baltimore street extended.

The convenience of all sections of this city being thus consulted and provided for, our depot in Washington, the plans of which have been perfected on the most extensive scale, and with a full regard in architectural design to meet the requirements which its location in the very center of the city and the neighborhood of the hotels, departments and public buildings require, its construction will be commenced forthwith, and with the character of the road we have built, the superior outfit we have provided, the obliging and accommodating officials, whom alone will be retained in connection with the road, and the liberal policy which we are satisfied will prevail, we feel assured of the public patronage and of every reasonable success.

The approaching completion of the road, which will dispense with their services, renders this a fitting opportunity for a just and merited testimonial upon our part to the efficient labors rendered the company by our engineers, and for the faithful and unexceptionally good work done by our contractor, Mr. Thomas Seabrook.

Test of Androscroggin Bridge.

The new iron bridge at Brunswick was tested September 12. Three locomotives with loaded tenders, weighing together, we are told, about 180 tons, at rest on a span 180 feet in the clear, caused a deflection of about 1½ inches. The engines running over at the rate of 15 miles an hour caused a deflection of less than 1½ inches in the center.

Contributions.

PRACTICAL FIELD ENGINEERING.

NO. VI.

LEVELING FOR CROSS-SECTIONS AND SIDE-STAKING.

After the line of railroad is located and the center stakes put in, and a working profile of the line has been made, the next thing to be done by the field engineer is to "cross-section" his work. This is a leveling operation to ascertain the points where the slopes of the cuts and embankments intersect the ground surface.

Before going on the field for this purpose you must procure a common field level-book and in the first column on the left-hand pages of this book set down the numbers of your stations or stakes, beginning 0, 1, 2, 3, etc. In the next column to the right set down the ratios of your grades; in the next the elevation of grade at each station, and the three remaining columns are to be headed, respectively, "Left," "Center," "Right."

What is meant by the *ratio of grade* is the rise or fall of the grade in feet for each hundred feet. Thus, a *rising* grade of 1 foot in 100 feet is designated thus +1 in the column of ratios, and a *falling* grade of 0.5 in 100 feet is designated —0.5 in the same column.

The manner of finding the elevation of grade at each station is by adding or subtracting, as the case may be, the ratio of grade to or from the elevation of the preceding station. For instance, if the station where your grade begins has an elevation of 400 feet above the datum, and grade at this point is four feet below the surface, the elevation of grade will be 396. Now suppose the ratio of this grade is +1, you have only to add 1 foot to 396 feet for the elevation of grade at the next station, and so on. If the ratio is —1, you subtract instead of adding.

Before going on the field prepare a sufficient number of small slips of blank paper to be used in making the necessary calculations. Some engineers are in the habit of using the unoccupied pages of their field books for this purpose, but the practice is evidence of bad taste amounting to slovenliness, and I would advise beginners to guard against it.

You are now ready to go upon the field, and you will find it well to take with you a carefully executed copy of the working profile of that part of the line to be "cross-sectioned." See that your level is in good working order, and have your rodman take with him a small hatchet and a supply of red keel. It is also quite convenient to have on hand a fifty-foot tape line, divided into feet and decimals of a foot, to be used in making such measurements as cannot conveniently be made with the rod.

Having arrived at the point on your line where you wish to begin leveling for cross-sections, set up your level at a convenient distance from the nearest bench and take a reading of the rod held on the bench, from which work up your height of instrument. This done, take a reading at the station where your work is to begin, and from this reading ascertain, by the rule given heretofore, the elevation of the surface at the station. Now the difference between this elevation and the elevation of grade, marked in your column of grade, will give the depth of cut or fill at this point, which is to be entered in the column of your field-book headed "centre," and must be preceded by the sign + if it is cutting, and by the sign — if it is fill.

Now the next things to ascertain are the points where the slopes of the cut or fill intersect the ground surface, and to do this with dispatch requires the exercise of good judgment in the matter of determining with the eye the amount of surface slope on either side of the centre stake. Of course readiness and correctness in this can come of nothing but practice. And as it often happens that you must depend wholly on the intelligence of your rodman, it cannot be too strongly urged that you improve every opportunity to instruct him in the practical performance of his duties. You will find that not only will you turn off work much more rapidly with a well "posted" rodman, but you will be saved much useless labor and a deal of vexation. Nothing is more wearying and harassing to the engineer in the field than to be under the necessity of continually yelling at a bungling rodman.

Of course if the ground surface is laterally level at any station the slopes of the cut or fill will intersect this surface at a distance on either side of the center stake equal to one-half the width of the *bottom* of the cut or the *top* of the embankment plus the base of the triangle of the slope. Thus if the slopes of a cut are 1 to 1, the distance from the center stake to the point where the slope intersects the ground surface will be equal to the depth of the cut, plus one-half the width of the bottom of the cut. If the slopes of an embankment are 1½ to 1, the distance from the center stake to the point where the slope intersects the ground surface will be equal to 1½ times the height of the embankment plus ½ the width of the top of the embankment. In these cases the depth of the cut and the height of the embankment are measured at the center stake. In practice, however, it most generally happens that the surface of the ground is more or less laterally sloping, which makes it necessary to take cross levels at each station, and often at points between the stations.

Well, suppose you have set up your level at a point whence you may take rod-readings at several stations, and you have, by transfers from a bench, ascertained the height of your instrument with reference to grade. Look at your field-book and find the rate of grade, so that you may add or subtract, as the case may be, as you proceed from station to station with your rod-readings and calculations. Now suppose the ground is laterally sloping, and, having set our level, we wish to ascertain how far out from the center stake the lower side-stake must be set for an excavation with a slope of one to one, bottom width twenty feet. Suppose we find our instrument to be eight feet above grade and the center cut four feet, which latter we place in the column of our field-book marked "center." Suppose the ower side is on the left, and, looking at the slope of the ground, we judge that 11 feet out this fall will be three feet. We have our rodman measure out that distance, and we there take an observation and find that the rod reads seven feet, which, subtracted from our height above grade, gives one foot cutting at that point. Now is this the proper distance out for the side-stake? Let us see. One half the bottom width of the cut is 10 feet, and the slopes are one to one. Then 10+1 gives 11 feet: correct! Now if the reading of our rod had been more or less than seven feet, it would have given more or less than one foot cutting, which would have proved our judgment to be at fault, and we would have had to increase or lessen the distance out, according as the cut was too great or too small.

The difference in leveling for the cross-sections of embankments is, that you add 1½ times the height of the embankment to the cut-measured distance, or the height of the embankment multiplied by the ratio of the slopes to 1.

It must be carefully borne in mind that leveling for cross-sections has a much more important object than merely fixing side-stakes to guide the grading contractors in their work, for it is from these cross-sections that the estimate of the cubic yards of the earthwork is made. Great care must, therefore, be used in taking these levels, in order that the estimate may be relied on accurate. In heavy work an apparently trivial mistake might cost hundreds of dollars.

As our next paper will treat of the best methods of estimating the cubic contents of earth-work, it only remains in this number to give a few rules and a few practical hints to guide the young engineer in his operations on the field taking levels for cross-sections and setting the side-stakes.

Note 1. Whenever you find any marked change in the ground surface between stations, have your rodman prepare a center stake and line it in, driving it at that point. Take a rod-reading and mark the distance from the center stake to this intermediate stake, plus 30, plus 40, plus 50 (+30, +40, +50), or whatever it may be, in your field-book between the proper station-numbers. Cross-section levels must be taken and side-stakes set at these intermediate points, just as at the stations, and you must not forget to make the proper fractional addition or subtraction of the rate of grade.

Note 2. The side-stakes may be set from the field-book after the cross leveling is all done, and I think this is preferable to doing both at once. You have only to take with you your rodman and an axman, your field-book and a tape-line. To set a side-stake look at your book and see the depth of cut or fill on that side, add this to half the width of the road formation (in cutting) for the distance out, measure this distance from the center stake at right angles with the line of the road, and there drive a broad, strong stake. The manner of fixing the point for the side-stake in embankment is precisely the same, except that the slope ratio is generally greater.

Note 3.—The depth of the cut or fill at the center should be marked in red keel on the face of the center stake opposite that on which the stake is numbered, and the depth of cut or fill at either side should be marked in the same way on the *inner* face of the side stake. Thus, if at either place it is four-feet cutting, you will mark the stake "Cut 4.0;" or, if it is fill, mark it "Fill 4.0," etc., etc.

The best form for a field-book is as follows. In the three right-hand columns the sign + denotes cutting and the sign — denotes fill:

Station.	*Ratio.*	*Grade.*	*Left.*	*Center.*	*Right.*
0	+1	400.00	+2.0	+4.1	+1.0
1		401.00	+1.3	+3.2	+2.1
2		402.00	+3	+5.1	+4.0
3		403.00	—1	0.0	+2
4		404.00	—2.0	—3.0	—4.2
5		405.00	—4.1	—5.7	—6.1

By reference to the above field-notes it will be seen that at station 3 the center is marked 0.0. This indicates that in passing from a cut to a fill the grade line cuts the ground surface at this station. If this point does not happen to fall at a station it must be found and indicated by a stake marked "*grade*," and levels must be taken here and side-stakes put in. This is done for the double purpose of indicating the point where the cutting ends and the embankment begins, in order to guide the grading contractors and to get a note in your field-book very necessary in making up your estimate sheets.

In taking leave of this subject, it seems important to remind the field engineer that, in order to get his work well under his control, the sooner he gets his line cross-sectioned and side-staked the better it will be for him. This done and his estimate sheets worked up, he will have time to turn his attention to setting out cattle-guards, culverts, trestles and bridges, in the meantime keeping his eye on those engaged in constructing the earthwork, remembering that unwearying vigilance is the field engineer's duty.

HOOSIER.

Railroad Manufactures.

The Ramapo Works is turning out 270 car wheels daily at the foundries, and boring, turning and fitting 80 pairs daily in the machine shops. There are orders in for nearly 20,000 wheels.

A stock company for manufacturing cars has been formed at Northumberland, Pa., and the building is now being erected there, 330 feet by 50, with slate roof, on the line of the Lackawanna & Bloomsburg Railroad.

Extensive brick shops are going up at Meadville, Pa., and are almost ready for the roofs.

The Baltimore & Ohio is building a number of new brick shops, a round-house, etc., at Newark, Ohio, the junction of the Central Ohio and the Lake Erie divisions.

La Crosse Bridge..

The Board of Engineers which recently reported in favor of fixing the location of a bridge over the Mississippi at La Crosse, opposite the foot of Mount Vernon street, in opposition to the application of the Milwaukee & St. Paul Railway Company (which desires to construct it some distance further up), was ordered to reconvene at La Crosse on the 23d inst., the Attorney-General having given a decision adverse to the correctness and propriety of their report.

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Editorial Announcements.

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE APPLICATION OF THE INDICATOR TO LOCOMOTIVES.

The use of the indicator is becoming day by day more general in all stationary as well as marine engines. The great benefits to be derived from the use of this instrument are being more generally recognized, and the users of steam power are becoming more anxious to know for a certainty what their engines are doing. It is strange that an improvement whose invention was almost simultaneous with that of the steam engine itself should not, during all these years, have won as high a place as its great usefulness entitles it to. When the engine left Watt's hands it was in many respects as perfect a machine as it is at the present day. The workmanship was not so good in most cases; the benefits derivable from the governor cut-off were not understood; high speeds had not been introduced generally; but for all that the engine was, in so far as principles go, nearly as perfect a machine as we find it now. We know the great value Watt placed upon the results obtainable by the use of the indicator, and when we look at the various improvements in the engines of the present, all of which are of a nature to increase the value of the indicator's results, we are astonished that its use has not become more general, in fact, almost universal. If we advertise for an engineer, and offer very good wages, out of the number who answer our want there will be but few who even understand how an indicator should be attached, much less comprehend the methods of working up the cards when obtained. Many think that it is a matter involving much mathematical knowledge, and one of those subjects involved in a certain amount of haziness and ambiguity. The fact is, that to determine the power developed is an operation requiring only a knowledge of addition, multiplication and division. To so understand a card that a fault can be found and remedied, requires a little practice—not more than ordinary engineers can easily obtain. Of course there are other calculations deducible from indicator cards requiring more knowledge and a more extended experience; but for the practical purposes of the engine-room they are not an absolute necessity. Once having convinced the owners and runners of steam machinery of the direct money value of these results, they will be quick enough to buy instruments on the one hand, and to learn to use them on the other. But as is quite common in this world, people prefer to stop the small leak in preference to the large one, and they are very slowly convinced of their error.

These remarks apply with equal force to locomotives, in which the use of the indicator is likely to be productive of very valuable results. It is true that in some shops the valves of the engines are set by the indicator, but it is not every engine which has the good fortune to be thus well treated. In the majority of cases measurements are made, everything looks right, and the engine is sent out as perfect. We know that it is seldom that the first setting of the valve is the correct one, even in a stationary engine, and that after some use the operation can well be repeated with beneficial results. How much more true this must be of a locomotive subject to the most severe handling of any kind of steam machinery, and whose valve adjustment is a matter of serious consequence in more ways than the consumption of fuel alone. Much of the smooth running of a locomotive is dependent upon the proper setting of the valves. It is true that the heavy cushion created in any slide valve driven by a link motion cutting off the steam before the end of the stroke diminishes the benefits to be derived from the valve being so set as to give an accurate lead; nevertheless, the exact moment of the admission of the steam in relation to the position of the cranks must be just as carefully observed. The points of exhaust cushion and relief must be carefully adjusted, as they are of even more importance than the lead in this special type of engine, for on them depends in a great measure the smooth running of the whole engine. A point only determinable by the use of the indicator, and one of perhaps more importance than any other, is the proper adjustment of the length of the valve-rod. If this is not right the valve is certain to be wrong, and the error is increased as the valve stroke is shortened by running the link's end nearer to the block. So much depends, in a locomotive, on the two engines operating properly together, a result only obtainable by a proper valve adjustment, that it seems that a point of so great importance should not be neglected, or at least that no effort should be spared to perfect the accuracy and certainty of its working. To accomplish these results the indicator presents itself as the best and, in fact, the only certain means. No great difficulties exist in the practical attaching of the instrument to engines and the obtaining of cards, even at the highest speeds. Arrangements can be made which shall provide for the operator's safety, and after that any one accustomed to the work can obtain all necessary cards in a very short space of time. Without doubt our stationary engines are not sufficiently taken care of in this respect, and even marine engines are left too severely alone; and when we come to the locomotive, we scarcely find that any tests have been made or experiments tried. It is, of course, impossible to say how and when such tests should be made; but when their great value is recognized, many of the difficulties existing in the minds of those in power will be cleared away, and time will be found for an operation the most practical, instead of the most theoretical, that an engineer is ever called upon to perform.

THE VERMONT CENTRAL.

For some years this corporation has been growing in power, and apparently in wealth, until a month or two ago it seemed, to the casual observer, likely to become and remain the controller of transportation over a large part of New England, with important connections and relations at the leading cities of all New England and the lower part of Canada. Indeed, it had something like the prestige of the Erie in the latter part of 1868, when Gould and Fisk went about conquering and to conquer, leasing railroads right and left, apparently taking everything offered them and having everything offered that they wanted. At that time many cool heads were turned by the audacity and apparent success of the Erie managers, and the impression gained ground that they would soon control many of the most important Western railroads. The Columbus, Chicago & Indiana Central was supposed to be theirs, and the Pittsburgh, Fort Wayne & Chicago was expected to follow.

Their triumphal progress was suddenly and sharply and very solidly arrested by the Pennsylvania Railroad Company, when it, to the astonishment of most, wrested the Columbus, Chicago & Indiana Central at a meeeting of shareholders called to confirm a lease to the Erie already agreed to by the directors, said directors voting a majority of the stock. Directors voting as shareholders saw reason to veto the action of themselves voting as directors. It had apparently occurred to some one that, after all, the important thing was, not what the lessees would promise to pay, but what they could pay and would pay; and if the road was to be let for more than it could earn, that it was specially important that the lessee should have a surplus income from some other property, or else credit, neither of which the Erie possessed. These facts, doubtless, had their influence on the Pittsburgh, Fort Wayne & Chicago Company, which finally refused the Erie's offer and also accepted the Pennsylvania's.

In Vermont there were long two rival companies, the Rutland and the Vermont Central. They were by no means prosperous in their youth, and many investors remember them to their sorrow. To what these early troubles were attributable, we cannot now say, not having the old accounts; but doubtless a light traffic in the State, which exports chiefly wool and dairy products, and has few manufactures and large towns, had something to do with it, and perhaps an excessive capital account had also. Both of the companies, we believe, became bankrupt, and were re-organized with lighter, at least different, capital accounts. Two noted Vermonters were the presidents, Hon. John B. Page, formely Governor, of the Rutland, and Hon. J. Gregory Smith, also a former Governor, of the Vermont Central. Both were ambitious, and seemed inclined to gain control of all the railroads that joined them. The Rutland succeeded pretty well with those in the western part of the State, while the Vermont Central took most of the rest and also invaded Massachusetts, Canada and New York, and its appetite seemed to grow by what it fed upon, until at last it swallowed its old rival, the Rutland, apparently being tempted by the offer of more than its property would earn. But the Vermont Central never halted. It obtained an outlet on the seaboard by leasing the New London Northern, prepared to lease various short lines which might be made tributary to this, and was credited with the intention of getting into its own hands lines which would connect its system with Boston on the east, and New York on the west.

Within a very short time it was reported to have been negotiating for the lease of some New England lines, and for securing others by aiding in their construction; but a few days ago came news that the company was hopelessly involved, and the notes of the company have gone to protest in Boston.

It is extremely difficult to give any trustworthy account of the causes which have led to this condition of things, because the company has not made public complete information as to its obligations. It is working, besides its own line of 118 miles, the Vermont & Canada, the Missisquoi, the Montreal & Plattsburg, the Montreal & Vermont Junction, the Stanstead, Shefford & Chambly, the Ogdensburg & Lake Champlain, the Whitehall & Plattsburg, the Vermont Valley, the Rutland Railroad, the Addison County Railroad, the Sullivan Railroad, the New London Northern, the Ware River Railroad—a total of 655 miles—so that its officers are working a system of 773 miles of railroad. It or its officers also controls the Northern Transportation Line steamers, which ply between Ogdensburg and Chicago and other points on the upper lakes, and the company leases the steamboat line between New York and New London and that between Plattsburg and Burlington.

This is a system not at all unmanageable, and its success should depend upon its profitableness. As a route from Montreal and the intervening country to Boston it is very good, and the traffic it gets from this district should be profitable. It has, however, entered into the field for the transportation of Western produce to Boston and New England, both in connection with its lake steamers and with the Grand Trunk. This is a traffic which it conducts at considerable disadvantages. Its line is very long, and slower than it is long, and shippers cannot easily be tempted to it without a reduction of rates, which, when accepted, has made it haul its freight one-seventh further for a less price than its rivals received. There is often a pretty sharp competition among its rivals, and when they were working for only a fair profit, the Vermont Central must often have been losing money.

But charges are freely made that the company has suffered from other causes than the natural unprofitableness of its traffic. Among these charges is one that the National Line was the property of a few officers of the company, and that its contract with the company was grossly unfair to the latter. Another is that many of the contracts for lease, etc., have been made by the officers virtually for their own benefit, and to the manifest injury of the company.

It will be more satisfactory to consider these charges after the officers of the company have made their statement and explanation of the condition of its affairs, which they promise to do directly, in a circular to the shareholders. It is to be hoped, at least, that the affair will be fully investigated and a clear exposition made of the affairs of the company. Mr. J. Gregory Smith has been a

man of much consideration in his State, and his name was supposed to give weight to the Northern Pacific Railroad Company, of which he was President from its organization until very recently. His communication to his shareholders will be looked for with great interest.

New Chicago Car Works.

That Chicago is rapidly becoming a very important manufacturing city is apparent to any one who will take the trouble to visit the South Branch of the Chicago River, at a distance of from four to six miles from the Court House. Manufacturing establishments of great importance are opening up all along the river there, and millions of dollars are expended in the construction of buildings and the purchase of machinery.

One of the most important of these enterprises is the car manufactory of P. E. Canda & Co., which is situated on the north bank of the river near Western avenue. The grounds cover 15 acres, and are accessible both to the largest vessels which sail on the lakes and by every railroad entering the city, by means of the net-work of roads that communicate with the Union Stock Yards.

The buildings which Messrs. Canda & Co. are placing on the ground are most excellent and substantial in their character, being of brick, with trussed roofs.

The shop where the wood-work in the car manufacture is to be done is a building 120 feet wide by 420 feet in length. In this the wood comes in at one end of the building in its crude shape, and is planed and sawed and fashioned and smoothed as it moves forward from machine to machine, until, as it reaches about the middle of the building, it is all ready to be put in its place in the future car. The north end of this building is to be used for erecting the cars.

One of the most curious things in this building is the Sturtevant blower, which, with its iron tubes branching from a large central tube resting in the truss work of the roof, sucks up the shavings as fast as they are made and conveys them to a receptacle near the boiler rooms.

Adjoining the wood-working department on the west is another building 70 feet wide by 220 in length, which is being fitted up as the machine shop and blacksmith shop. The building is completed, and is in all respects as finely constructed as the other. The heavy truss work is designed to hold the shafting so firmly that it will not need to be "lined up" after it is once got in place.

This iron-working department is being fitted up with all the most modern machinery for working that metal.

South of the machine shop are the engine and boiler rooms. The boilers are capable of generating steam for a force equal to 200 horse-power, while the engine, an improved 180 horse-power Corliss, has already been put in position to drive the machinery.

Adjoining the large wood-working building first mentioned is to be a planing and sawing room, 40 by 120 feet in size, which is yet to be built.

A paint shop, 160 by 150 feet in size, is in process of erection; also a drying house and an office.

The transfer table, which will transfer the cars from the place of construction to the paint shop, and from the place of completion to the place of shipment, is 45 feet in width by 225 in length The whole of the works will cover several acres of ground.

The machinery is now being put in place, and is, of itself, an object of great interest, being of the latest and most improved patterns in all respects. It consists largely of matchers and planers, from the Fay Works, of Cincinnati; Gray & Wood's dimension planers and surfacers, Daniels' planer, wood and iron cross-cut saws, a four-side inside molding machine, a four-rolled and a six-rolled match machine from the Cooper and Mt. Vernon Iron Works, Ohio. Besides these are car tenon machines, Lane & Bodley mortisers, universal boring machines, universal wood workers, three-side molding machines, Merriman bolt cutter, screw-cutting machines, box-boring machines, bolt pointing machines, horizontal borers, band saws, shaping machines, jig saws, &c., and all the wonderful machinery which none but a machinist can fully comprehend.

In the iron-working department are drills, lathes, iron planers, shapers, hydraulic wheel-presses, punches, shears, bolt-headers, forges, etc. The machinery is from many of the best manufacturers in the country, such as the New York Steam Engine Works; Pettingill, Glass & Co., Cleveland; Wm. Sellers & Co., Philadelphia; Columbian Iron Works, Chicago; Industrial Works, Philadelphia; Lewis, Oliver & Phillips, Pittsburgh. The forges in the blacksmith shop are connected with a Sturtevant 8-inch blower.

The shops are calculated to construct and turn out each day 17 freight cars; or 14 freight cars a day with 6 first-class passenger cars per month.

The cost of the works will not be far from $250,000. The machinery alone will cost about $60,000, it is estimated. A slip having 1,800 feet of dockage and large enough to accommodate the largest lake vessels is now in process of construction, and will intersect the grounds in such way as to enable material to be landed in the most convenient places.

The people of Chicago already regard this undertaking as one of the most important that has ever been undertaken by private enterprise, and as the inauguration of what may become a vast system of manufactories for the city.

Record of Track Increase.

Oregon Central, extended from its late terminus at Cornelius, 10 miles from Portland, southward 10 miles to the Tualatin River. *St. Louis & Iron Mountain—Arkansas Branch*, extended from Poplar Bluff southward 15 miles to Neeley's Swamp, Mo. *Port Royal*, extended from Hoover's northwest 12 miles to Allendale, S. C. *West Amesbury Branch*, completed by laying of the rails from a junction with the Boston & Maine Railroad at Newton, N. H., east to West Amesbury, Mass., 5 miles. *Burlington & Southwestern*, extended from Moulton west by south to Caldwell, Iowa, 10 miles, and, on the *Lexington & Kansas City Division*, completed from Laclede (on the Hannibal & St. Joseph Railroad) north to Linneus, Mo., 6 miles. *Detroit & Bay City*, extended from Detroit northward to Orion, Mich., 30 miles. *South & North Alabama*, completed by the laying of rails from Blount's Springs southward to Birmingham, Ala., 33 miles. *Waco & Northwestern*, extended four miles to Waco, Texas.

This is a total of 125 miles of new railroad.

THIRD-CLASS CARS are unknown in this country, unless we may reckon as such the wretched boxes which some companies provide for immigrants, but which the ordinary traveler never sees even. But in England these carry nearly four-fifths of the passengers. Heretofore these cars have not been attached to the faster trains, so that the advantages of the higher classes included greater speed as well as greater comfort. Recently, however, several of the companies have attached third-class cars to all or nearly all of their trains. The result has been that the number of third-class passengers has largely increased, while the number of second-class passengers has decreased, indicating that many heretofore have traveled second-class who cared more for the faster speed than for the better accomodations of the cars. The Great Western Company reports that for the half-year ending with June, during four months of which the plan was in operation, there was an increase of 88,230 in the number of first-class passengers, with an increase of £3,795 in receipts; a decrease of 207,417 in the number of second-class passengers, with a decrease of £46,218 in receipts; and the enormous increase of 2,377,593 in the number of third-class passengers, with an increase of £87,378 in receipts. On the whole, there were 1,958,406 more passengers carried, and £44,955 more received for carrying them. As the first-class traffic could hardly have been affected by this change, it is taken to indicate the natural increase, and on this basis the result of the experience is a loss. This is shown more clearly by the fact that the increase in the two months before the change was 372,526 in the total number of passengers carried, and £28,200 in the passenger receipts, 18 pence each; while in the four months after the change 1,585,880 more passengers were carried, with an increase of only £19,695, or 3 pence per passenger in receipts.

The chairman of one British company—the Blyth & Tyne, which has a short line—said recently at a shareholders' meeting that he had had serious thoughts of doing away with their first and second-class cars, and running only third-class, "adopting the American system," he called it; which is a slander on the American system. We believe that no company in this country has cars so deficient in accomodations and comfort as the ordinary English third-class cars; while on many roads the cars are really first-class. It is easy to see that on a short line, where it is rarely easy to get more than one or two car-loads of passengers for a train, it must be very costly to keep and run cars of three different classes, and, doubtless, the running of one class only would be economical, whether or no the running of third-class only would be expedient.

THE ERIE CANAL some person who has not the fear of De Witt Clinton's ghost before his eyes proposes to drain and make the bed of a great freight railroad, with ever so many tracks and delightfully easy grades (except at the locks, which are to be provided for when the water is gone). The proposer speaks of this as altogether a new idea. Just how it would be superior to existing or possible railroads does not appear. The New York, West Shore & Chicago, it correctly reported, will have as easy grades as the canal would give, and probably more evenly distributed; the New York Central & Hudson River will very soon have separate tracks for freight on which trains can be run as slowly as is found profitable; and—a matter of great importance—all the existing lines are much shorter than the canal route, and are complete—that is, they have their termini at the metropolis, while the drained canal would end at Albany, unless, indeed, the Hudson should be drained, too.

The change from a canal bed to a railroad bed is, however, not unknown and hardly uncommon. The Eastern Division of the Pennsylvania Railroad is, we believe, in the bed of an old State canal, which accounts for its numerous and various and apparently purposeless meanderings; which, by the way, the company is now correcting by some very expensive and admirable engineering work. The Indianapolis, Cincinnati & Lafayette Railroad Company secured its entrance into Cincinnati by purchasing an old canal and laying its track in it, and this manœuvre, securing it a very convenient entrance in the face of the opposition of other railroad companies, which felt sure they would be able to defeat any application by the new company for the right of way into the city, was esteemed brilliant railroad strategy, for which, we believe, Mr. H. C. Lord, the late President of that company, got much credit.

UNDERGROUND RAILROADS attract much attention in New York just now, where the construction of one is about to be begun. Therefore the experience of the London roads is worth our notice. The leading one—the Metropolitan—has recently made its report for the first half of 1872, and it is by no means satisfactory to the shareholders. They have a dividend at the rate of only one per cent. per year, and more capital is asked for extensions. The company's affairs, however, are said to be grossly mismanaged, and the shareholders deceived heretofore as to the true condition of the property. Thus from 1863 to 1868, inclusive, the average dividends were at the rate of 6½ per cent. yearly, while, it is reported, the *gross earnings* were only at the rate of less than 5 per cent., the dividends having been paid out of capital. The capital account has been swelled by extravagant professional charges, parliamentary expenses, etc. The engineer's charges for this line, eight miles long, were nearly $700,000, and the parliamentary and law charges more than $1,600,000, or $200,000 per mile!

Of course the profit of such a railroad will depend very much on the cost of it. This one in London cost nearly $5,000,000 per mile. One thing we may be reasonably sure of, and that is that Vanderbilt's "rapid transit" road will cost nothing like so much, and indeed, that there will be no unnecessary expenditure on it.

A road costing $1,000,000 per mile might well pay good dividends when one costing five time as much paid very small ones.

CHANGES OF GAUGE have been made so frequently in this country that we have come to regard them as no great feats; but we see that the English papers speak of a recent change of the Great Western Railway of England, from the 7-feet to the standard gauge for about 250 miles of double track, which was accomplished within a month, as a marvelously rapid operation. The changes of the Missouri Pacific (283 miles) was made in one day, and that of the Ohio & Mississippi (340 miles) in less than ten hours, we believe; and it is here thought almost indispensable that the change should be made with the least possible interruption to traffic, and so it is usually made in one day, and that day Sunday, when fewest trains run.

THE NATIONAL RAILWAY COMPANY has been offended by a letter written by Mr. Nathaniel Niles, late Speaker of the New Jersey Assembly, and published in the *Nation*, and it has sued him for libel, laying the damages at $5,000,000. If it can recover this handsome sum it need ask no payments on stock and offer no bonds, but will have money enough to complete its road without troubling its shareholders or the rest of mankind. We know several companies which would very much enjoy being libeled to that amount. But then the case isn't decided, and even if all the damages claimed should be awarded, suppose Mr. Niles wouldn't pay?

THE EFFECT OF GAUGES ON EXPENSES was long ago argued at length, and is now brought up in a new form by the controversy over the new narrow gauges. On this subject the experience of the roads of 7-feet gauge in England deserves notice. These on the average are worked quite as cheaply as the roads of standard gauge, and some of them show a very low proportion of working expenses.

Meeting of the General Ticket Agents' Association.

The semi-annual meeting of the General Ticket Agents' Association was called to order at the St. Nicholas Hotel, New York, at 11 a. m., September 20, by the President, Mr. E. A. Ford. Messrs. J. B. Peck, M. L. Sargent and J. W. Gore were appointed a Committee on Credentials. The following members were present:

Atlantic, Mississippi & Ohio, F. Huger.
Adirondack, C. E. Durkee.
Albany & Susquehanna, S. E. Mayo.
Atchison, Topeka & Santa Fe, M. L. Sargent.
Atlantic & Great Western, W. B. Shattuc.
Atlantic & Pacific, E. A. Ford.
Burlington, Cedar Rapids & Minnesota, C. J. Ives.
Burlington & Missouri River, A. E. Touzalin.
Buffalo, Corry & Pittsburgh, J. A. Burch.
Camden & Atlantic, D. M. Zimmermann.
Central of Georgia, W. F. Shellman.
Central of New Jersey, H. P. Baldwin.
Chicago & Alton, James Charlton.
Charlotte, Columbia & Augusta, E. B. Dorsey.
Chicago, Danville & Vincennes, C. B. Mansfield.
Chicago, Burlington & Quincy, Samuel Powell.
Chicago, Rock Island & Pacific, E. St. John.
Cleveland, Columbus, Cincinnati & Indianapolis, A. J. Smith.
Chicago & Iowa, Henry Starring.
Columbus & Hocking Valley, E. A. Buell.
Danbury & Norwalk, H. Williams.
Delaware, Lackawanna & Western, W. F. Holivel.
Des Moines Valley, James Barker.
Erie, J. N. Abbott.
Eastern, George F. Field.
Flint & Pere Marquette, G. W. Ledlie.
Georgia, J. A. Roberts.
Great Western of Canada, W. Edgar.
Indianapolis, Peru & Chicago, F. P. Wade.
Illinois Central, W. P. Johnson.
Indianapolis, Bloomington & Western, J. W. Brown.
Indianapolis, Cincinnati & Lafayette, C. K. Lord.
Jeffersonville, Madison & Indianapolis, A. Anderson.
Kansas Pacific, B. R. Keim.
Lackawanna & Bloomsburg, L. C. Darte.
Lake Shore & Michigan Southern, J. W. Cary.
Louisville, Cincinnati & Lexington, S. S. Parker.
Memphis & Charleston, A. A. Barnes.
Michigan Central, B. Mosley.
Milwaukee & St. Paul, A. V. H. Carpenter.
Missouri, Kansas & Texas, Thomas Dorwin.
Mobile & Montgomery, John S. Pollard.
New Orleans, Jackson & Great Northern, S. E. Carey.
New York & Oswego Midland, W. H. Weed.
New York Central & Hudson River, C. H. Kendrick.
North Carolina, S. E. Allen.
Northeastern (of S. C.), P. L. Cleapor.
Northern Pacific, G. G. Sanborn.
Northern Central, E. S. Young.
North Pennsylvania, Ellis Clark.
Ohio & Mississippi, R. T. Brydon.
Orange, Alexandria & Manassas, J. M. Broadus.
Pennsylvania, D. M. Boyd, Jr.
Petersburg & Weldon, D. R. Dunn.
Philadelphia & Erie, J. W. Gore.
Philadelphia & Reading, C. G. Hancock.
Philadelphia, Wilmington & Baltimore, George A. Dadmun.
People's Line of Steamboats, J. C. Hewitt.
Pensacola & Louisville, D. H. Cram.
Peoria, Pekin & Jacksonville, John S. Cook.
Pittsburgh, Fort Wayne & Chicago, F. R. Myers.
Providence & Worcester, W. M. Durfee.
Providence & New York Steamship Line, Z. Williams.
Raleigh & Gaston, Thomas Badger.
Richmond, Danville & Piedmont, John R. Macmurdo.
Rockford, Rock Island & St. Louis, T. Penfield.
Rome, Watertown & Ogdensburg, H. T. Friary.
Savannah & Charleston, S. C. Boylston.
St. Paul & Pacific, Geo. I. Oakes.

St. Louis, Vandalia, Terre Haute & Indianapolis, Charles E. Follett.
St. Louis & Southeastern (Consolidated), W. B. Davenport.
St. Louis, Kansas City & Northern Line, F. Chandler.
St. Louis, Memphis, Nashville & Chattanooga, W. L. Danley.
Seaboard & Roanoke, James W. Brown.
Selma, Rome & Dalton, John B. Peck.
Springfield & Illinois Southeastern, C. M. Stanton.
Toledo, Peoria & Warsaw, H. C. Townsend.
Toledo, Wabash & Western, J. U. Parsons.
Union Pacific, Thomas L. Kimball.
United of New Jersey, L. P. Farmer.
Western & Atlantic, B. W. Wrenn.
Western of Alabama, S. D. Hubbard.
West Jersey, Cape May & Millville, Joseph W. Allen.
West Wisconsin, William James.
Wilmington, Columbia & Augusta, A. Pope.

The convention continued in session Friday, Saturday, Monday and until late Tuesday evening. The time was chiefly occupied, as usual, by the adjustments of rates and divisions of rates, a few not very great changes having necessitated a new adjustment, which, owing to the very large number of parties interested, whose interests, too, are often conflicting, is a work requiring considerable time. There was much other important work done, however, especially a change in the constitution which is intended to make the working of the Association more effective. If it is accepted generally by the railroad companies, a policy once agreed upon by the Association will become binding upon the companies. A resolution that seaboard emigrant rates shall not be applicable to interior points, but to *bona fide* foreign or seaboard emigrant business only.

Mr. T. L. Kimball, of the Union Pacific, was chosen a member of the Executive Committee, to succeed W. P. Johnson, of the Illinois Central.

It was voted that Washington, D. C., be the place for holding the next annual meeting, which will take place on the last Friday of March but one.

Mr. W. R. Barr, late General Ticket Agent of the Erie Railway, was chosen an honorary member.

An election being necessary after the adoption of the new constitution, Mr. E. A. Ford, of the Atlantic & Pacific, was chosen President for the ensuing half year; S. E. Cary, of the New Orleans, Jackson & Great Northern, Vice-President, and Samuel Powell, of the Chicago, Burlington & Quincy, Secretary. All these were re-elections, the terms having only half expired, and the officers being elected only because of the adoption of a new constitution.

The Association had an unusual amount of work to do, and its members applied themselves to business pretty steadfastly throughout the four days' session, and accomplished really a great deal of work.

Serious Rules for Travelers.

These "serious rules for travelers" appear in the *Official Guide* of the "Great Central Route," and were prepared by Mr. Joseph Taylor, of the Great Western Railway, the compiler of the *Guide*:

Always check your baggage before starting; but if you lose your checks afterward, you might as well have saved yourself the trouble of checking it.

If you have some solid hand-baggage with you, be careful to place it securely in the rack. A passenger once neglected to do this, and it fell with great force on the head of his mother-in-law, with whom he had some trouble.

Always buy your ticket from an authorized agent before entering the cars; but if you have to pay the conductor for your passage, do not stop him to tell him all the reasons why you are traveling. He would not care about that, although he might be a sympathizing man.

To all men I would say, never look out of the window when the car is in motion with your hat on—it might be blown off.

Never look out of the window when it is dark, because your head might run up against the parapet of a bridge, or a water crane, etc.

Some people prefer an upper berth in a sleeping-car and some a lower; but if there was one between the two, I should say give me that for steady riding.

Do not be always wanting the conductor to let you compare the time of your watch with his, and asking him how much you are slow; neither ask him frequently if he is on time; or if he is not, when he expects to be. A conductor is not an angel.

Always be considerate with your fellow passengers, and if you are traveling with a tailor whom you owe for your last new suit of clothes do not let him sit in the draft of the window.

Some people say: that in the event of an accident, it is best to sit in the rear car—others would prefer the centre car—and others would like to sit well forward. Such is the difference of opinion. But if you were to ask me which I would choose, I should say, let me sit in my arm-chair at home.

Honesty is the best policy, but it is very poor policy not to insure your life against accidents by taking a policy in the Travelers' Insurance Company of Hartford, Conn.

The rule of most lines is not to allow passengers to stand on the platform. Some evade it by sitting down; but of the two, as a man and a father, I would rather be inside the car.

If you have got the measles do not distribute them among the passengers—there might not be a measle apiece.

It costs a railroad company as much to sweep out the leavings of some men as they pay for their tickets. If you must eat pea-nuts and apples, put the shells and parings in your hat, or else throw them out of the window, but mind you do not hit the station-master.

To newly married couples I would say, do not be deterred from the sweet interchange of tender glances and tokens of affection by the offensive notice of other passengers. "Frail and fleeting are the joys of Love's young dream." Besides you will awaken the agreeable memories of crabby couples who were married some time ago.

If you are asked to play at three-card monte and you like to try the game, never go higher than five cents a time. If you keep to this humble amount you will always win; but if you venture a V or an X you are sure to lose.

If it becomes necessary to eject you from the car for disorderly conduct, don't put the conductor, his three brakemen, baggageman, engineer and fireman to the necessity of dumping you; retire in a high-toned manner.

You must always have a ticket or a pass (the latter generally preferred by travelers). The passenger who said his face was his ticket did not like to have it punched by the conductor.

Never attempt to get in or out of a railway car while it is moving, unless you prefer a pair of basswood legs. Some elderly men do it to show their agility, but I think they show their tom-foolery.

Beware of yielding to the sudden impulse to spring from the car to recover your hat which has blown off, unless you want that hat in the worst way.

If you must walk across the track, look both sides and behind and before you all the time, and mind your foot does not get stuck between the rails.

Never try to hand things into car windows when the train is moving. I saw a man once lose his footing, and afterward his foot.

If you look out of the window, never turn your head toward rear of train, unless it is backing up; if you strike anything—up goes your hair.

There is a smoking and chewing car on most trains. Don't chew in the first-class coaches.

Choose one of the end berths, over the trucks of sleeping cars, if you snore much; the extra noise there will tone it down nicely.

I would say to a young man traveling alone, do not be too amiable toward young ladies on board; many a youth has been imposed upon and had cause to repent. You cannot be too careful.

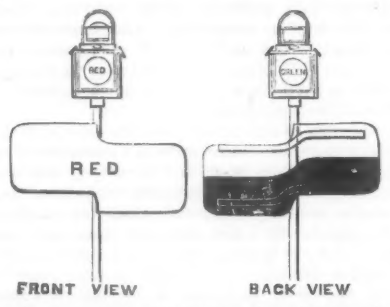
To a young woman I would say, never love a man because he wears a ragged coat.

These are some of woman's rights on the cars: To occupy two seats, while I stand; to have the window open, while my neck gets stiff; to have the lower sleeping-car berth; to have her berth made up first, and to have first chance to wash in the morning.

Alteration of Distant Signals on the Midland Railway.

The distant signals on this line consist of an oblong board; when turned facing a train they are "on," when turned edgeways so as not to be seen they are "off." Great difficulty arose then to distinguish at a distance whether a signal was facing the train or whether it was simply the back of a signal belonging to the other set of rails. To remove this difficulty the right hand sides of the boards are to be lower than the other, so that at sight it will be seen to which line it applies. Some of the signals have already been altered to this pattern, and have been found to answer well. All new distant signals will be made of this pattern, and it will also be applied to the old signals as soon as possible. I think the "directions" will interest your readers.

With a view to increase the efficiency of the distant signal in use on the Midland Railway, by enabling drivers, on sighting a distant signal, to distinguish by the shape of the signal, as well as by the color of it, whether it is applicable to the line on which they are running, or whether it is simply the back of the signal which is presented to them, it has been arranged that the form of the disc shall be altered and shaped as shown below.



It will be observed that the disc consists of a high side and a low one, and the signal will be so arranged that, when turned on against an approaching train, the high side will always show on the left-hand side of the post as drivers approach it, and the low side on the right-hand side of the post. Drivers will easily recollect that, as all semaphore signals are shown on the left-hand side of the post, so the elevated side of a distant signal shown on the left-hand side of the post indicates that the signal applies to the line on which they are running, while the low part of the signal appearing on the left-hand side of the post indicates that the back of the signal is toward them, and that it applies to the other line, and not to the one on which they are running.

When the signal is at "all right," the board is turned edgeways so as not to be seen, and the lamp shows a white light.—*Correspondent English Mechanic.*

Locomotive Whistling.

In an article on this subject, the Boston *Advertiser*, giving the experiences of the Boston & Albany Railroad, says:

If the residents on that line only were affected, a local interest only could attach to it; but the old rules and practice there were substantially the same as upon other roads in the State and country. For this reason it has a far wider interest. What, then, were the changes in this case? What were the conditions? And what is the result?

1. Formerly the whistle was sounded when approaching and at eighty rods distant from every regular station. This was believed necessary to warn passengers on the tracks and platforms, or who had occasion to cross the tracks in advance of the coming train. It also informed the agent, that he might be outside to see to his duties. We once knew the inquiry to be made of several station agents as to their view of abolishing this signal, and nine-tenths of them answered it could not be done with safety. Where trains are run on time, however, as they ought to be, it was believed that the clock is a better guide for all concerned, and that the rashness of passengers or others which leads them to defer the necessary crossing of tracks until the locomotive is so near the station as to make it dangerous, cannot be cured by a whistle. Besides, the bell can be as surely heard in ordinary weather at the distance of eighty rods as the whistle. Accordingly the *station whistle* was given up. At highway crossings the custom was to sound the whistle and ring the bell, whether a flagman was there or not. Long and painful experience has, however, shown that bell, whistles and flagmen do not prevent and cannot prevent distressing accidents at grade crossings. How far the whistle has prevented them or how the balance stands between those it has saved and caused, must always be a question. Each of our elder readers can tell of maimings and deaths from the running away of horses it frightened. Nor can it be doubted that travelers have been less cautious than they would have been had it not been in use, by believing, mistakenly, that they should always hear it when a train was approaching. Sometimes it may not have been sounded; but far more frequently through this belief their minds had other more engrossing thoughts.

But the most frequent causes of accidents at crossings the whistle cannot affect. Among these is recklessness. Men take risks in defiance of all warnings, and prefer to run the chance of saving a few seconds by driving across just ahead of a train rather than wait and save their own and others' lives. Sleep on the part of the drivers is another cause, especially marketmen in the early morning in this vicinity; and, alas! in cases not a few, drunkenness. With the whistle, flagmen keep within their houses until it is heard, instead of being governed by their clocks and eyes. Its eventual disuse, we believe, would decrease the number of accidents by increasing the vigilance of all. In the case we are speaking of it was given up at crossings by day wherever flagmen were stationed, and by night at all crossings, the head-light being its substitute by night. The exceptions were times of fogs and severe storms and such crossings as are recognized as "dangerous" by being on sharp curves, or where the view of travelers on the highway is cut off by natural or other obstructions. Its use as a signal to brakemen has continued, and whenever necessary to save human life. Increased emphasis was laid upon the duty of ringing the bell whenever the law or prudence requires, and upon the fidelity of flag and gate men.

2. What were the conditions? In seventeen miles from Boston there were twenty-one grade crossings. The number of carriages and persons passing during twenty-four hours was recently noted at some of them. At one there were 1,418 carriages and 4,692 persons on foot; at another, 1,100 and 790; at a third, 437 and 1,586. Four averaged 995 carriages and 2,059 persons on foot. Including passenger, freight and gravel trains there pass daily each way, over two of these crossings, more than one hundred trains. In four others, eighty, and over nine others sixty trains. It ought to be said that, previous to the time of which we are speaking, where one whistle could warn two or three crossings it had been done. In Newton and in West Newton, where there are three crossings, one whistle only was sounded for the three in the village. Yet the change in the rules lessened the daily number of whistles on the division more than one thousand. Four weeks have passed—the experiment having begun on the 19th of August—and no accident has occurred. While we do not claim this result as determining either way to what extent whistling can be given up with safety, it strongly supports the view we then advocated, that there was quite too much. The effect in adding to the peace and happiness of whole communities, and especially to the comfort of the sick, and the additional safety to all who drive horses on highways parallel with the railroad, need not be told. We hear and can believe it has added to the value of real estate. As public attention is more and more directed to the subject, an increasing number of families will surely elect to have their homes on such railway lines as use the whistle least.

Regarding, then, the question of "how much" as likely to be an open one for a long time, we yet know no good reason why an experiment which has been successful for four weeks may not be good for forty weeks, subject only to the same contingencies as when the whistle was more frequently used.

Reading Railroad Coal Piers.

The extent of piers and docks at Port Richmond, on the Delaware, belonging to the Reading Railroad is, perhaps, but little known, except to those who have business in that section of the city. At this point can be obtained some idea of the enormous extent of the coal operations in Pennsylvania. The Reading Railroad Company own a tract of land extending for more than a mile along the Delaware, and so rapidly has the business grown that extensions of docks and piers have to be frequently made. At the present time, the river frontage of shipping piers amounts to 3,000 feet. There are twenty-one shipping docks, having a total length of 18,000 feet, the longest dock being 775 feet; and their width varies from 60 to 137 feet. These docks furnish at one time accommodations for 224 vessels and boats. The water in these docks varies from ten to twenty feet at low tide, with a tide rise of six and a half feet.

In addition to the docks, there are 23 shipping piers, the largest being 1,172 feet, and the shortest 381. The total length of pier trestle-work is 20,212 feet, upon which is laid 10¼ miles of single track, beside there are 22½ miles of track connecting with the piers. The coal cars are provided with trap doors in the bottom, through which the coal is passed down long shutes, 169 in number, and rapidly loaded in vessels. Although these piers and docks are not designed for storing coal, but simply for its rapid transit to the vessels, yet it sometimes happens, for lack of vessels, that the coal on its arrival must be stored. The capacity at this place for that service is estimated at 175,000 tons, which would make quite a respectable pile if dumped altogether.

The heaviest annual shipment from the piers was in 1869, when it reached the enormous amount of 3,500,000 tons; the heaviest weekly shipment was for the week ending September 3, 1870, the amount being 95,858, and the heaviest daily (28,000 tons) was August 31, 1870. The receipts of coal at Richmond on the last named day reached to 18,600 tons, requiring 37 trains and 3,722 cars to convey it to the Delaware River. There are connected with the docks 35 weigh scales, used in the shipment of coal, with a weighing capacity of 25 tons each.

The company now own as much more adjacent river front, which is reserved for the future requirements of the coal trade. The large number of vessels arriving at the company's docks, and the handling of the coal, give employment to a large number of hands, reaching at times to over 1,400 men. The company, in addition to bringing coal to Richmond by railroad, owns 83 barges for shipping coal to New York by way of the Delaware & Raritan Canal, together with six iron steamers, for delivering coal to Eastern ports.—*Philadelphia Public Ledger.*

Electro Science as a Part of the Education of Civil Engineers.

[A paper read before the American Society of Civil Engineers by Stephen Chester, C. E., member of the Society, at its Fourth Annual Convention, held in Chicago, June 5 and 6, 1872.]

There are few subjects with which, in a general way, the mass of the people are better acquainted than that of electricity.

Nearly every school boy passes through a period when his whole soul is absorbed in the preparation of glass bottles and Leydon jars; often maternal patience is tried to its utmost extent in the discovery of dilapidated table-cloths and varied colored garments, sacrificed in the interest of juvenile research in the school of Voltaic science.

Merchants, manufacturers and brokers are becoming more than amateur telegraphers, and in every department of industry electricity is being used as a practical agent, and practical results are obtained. Yet there is no science of which so little is understood by practically scientific men.

I propose, therefore, to submit for consideration some of the reasons which seem to me to account for the apathy of that class of men in making exhaustive research, or even to exhibit general interest in an element already largely utilized by application in almost every known art, and assuredly destined at an early day to hold a position of still greater magnitude and importance.

For many years, known only in the phenomena exhibited in the chambers of natural philosophy and of educational institutions, the subject of electricity was regarded not as one of special or practical utility, but simply of such slight interest as might belong to the contemplation of any natural phenomena, and one of which no man of education and culture should be entirely ignorant.

Its first application to an important and useful art was to that of telegraphy, and so limited then in this field were the resources of scientific men, that the application of electro-magnetism to the purposes of distinct intercommunication was, and still continues to be, regarded as an entirely new and original discovery.

We observe here that the application of electricity in this instance was not to accomplish more than a special and limited result, through the special and limited means of repeated electro-magnetic impulses. The problem to be solved was simply the production of controllable and recognizable signals at a distance. This accomplished, questions of economy, and expedient means of producing the element upon which these results depended were for after consideration, and were naturally esteemed of relatively insignificant importance.

The rapidly increasing demand for quick communication between distant places soon made electro-telegraphy one of the most important business enterprises of the country, and under this stimulus lines sprang up in all parts of the United States and of the world; armies of employees soon became trained and skillful experts in the practice, and indeed in the general knowledge of the subject, so far as producing the special and limited results required in this specific application.

Hence, specific experimental knowledge of electricity as an applied science has been almost exclusively confined to a class of men, who, however bright and intelligent they may have been, were nevertheless entirely unqualified to develop largely any important and valuable result from their relatively wide experience, because, first, they came almost wholly from a class of society early thrown into active employment with but an ordinary school education; second, no antecedents of employment or training had prepared them in capacity or disposition for the habits of exhaustive analysis is required to develop a new science: and, lastly, their field of observation and experiment has always been limited to the accomplishment of a specific result.

In later years, the many new and useful applications of eletricity in arts other than electro-telegraphy have stimulated the competitive efforts of manufacturers to further and more important applications. Under this stimulus, the attention of the of the scientific world has of late been drawn more directly to the subject, and men like Seimm, Clark, Becquerel, Sabine, Dumoncel and others, have made valuable additions to general science in elaborate works upon electricity.

But these are for the most part "men of the schools," and while their books evince patient study and careful analysis, the character of our standard works is not such as we would expect and require from men who, from previous training and long habits of practically applying abstruse theorems to actual construction and problems to be solved, would naturally investigate this subject rather in its application to specific results than in its general connection with abstract science.

Again, growing out of the antecedents that I have mentioned, is a popular and widely different error, that this is not a positive science (if I may use the expression in this connection); that all knowledge of the laws governing this subject must of necessity be vague—uncertain, and beyond the limits of mathematical measurement and calculation; and that this mysterious invisable element is recognizable only in, and through the phenomena attending its vibrations and movements, and by which, then, the experienced expert may judge of the presence of the unseen agent with about as great a degree of certainty as the physician forms his diagnosis of disease from the varying symptoms of his patient.

On the contrary, notwithstanding the fact that our researches in this direction have been hitherto desultory, and far from exhaustive in their nature, and our acquaintance with the laws governing the operations of electricity are very limited—yet we have developed this fact with great certainty—that it is no uncertain science, but one susceptible of exact analysis, conforming to arbitrary, positive rules and calculation. This invisible, silent and mysterious force can be measured in its length, breadth and thickness with the accuracy that the beam of a truss may be measured; the consumption of material required to develop it in known and determinable qualities, may be as closely estimated as the effective working amount of steam can be computed, from the amount of coal burned; and the electro motive effect of this force, under any given conditions, may be as exactly calculated as that of the thrust of a brace under given conditions. I do not say that this has also been literally accomplished; but such advances have been made that the ultimate result is no longer a matter even of probability.

Already European governments have made this subject one of the principal studies in the course of military education. In this country, our military and naval schools have included in the courses, with instructions of a general character, the application of electricity to specfic offensive and defensive objects, and we have, both in the army and navy, schools for teaching in torpedo and signal service. It is not necessary, if the time would now permit, to point out how inadequate such instructiyn must be, except so far as to accomplish the specific limited object in view.

To the civil engineers of the country, men peculiarly fitted to the task by reason of special training and experiences, *mechanics* rather than chemists, philosophers and abstract scientists, belong the duty of developing this subject to the dignity of a practical science.

As my time is nearly exhausted, let me add one reason why this subject should be entrusted to the hands of practical engineers, and not to philosophers and students of abstruse science only—*the public welfare demands it.*

Under cover of our general American apathy, to which I have before alluded, the popular impression has been largely cultivated, that this is a vague, uncertain, eccentric power, its laws unknown and undiscoverable, and that, the simple manipulations of telegraphy could be acquired only by special experts; and more by reason of this popular ignorance than from any other cause, extensive telegraphic monopolies have been built up, to which we are paying a profit of 400 per cent. for every message we send by them.

Lastly, let me remark to the body of men before me who have attained individually to reputations of which the country may well be proud, and collectively to an eminence second to that of no similar body in the world, I cannot but think it a burning shame that the greatest, richest, and politically the most powerful telegraph company in America, if not in the world, should, from necessity, if not from a less reputable reason, have been induced to secure the services of an English expert to instruct operators in the first principles of their own especial calling.

It is hardly to be doubted for a moment that this science, entering as it already does, and will through so many devices, into the manipulations of many useful arts, will, in the future, form an indispensable part of the education of civil engineers. In our time and generation we may anticipate this inevitable result.

DISCUSSION.

Mr. COLLINGWOOD—Will Mr. Chester state some of the important effects of electricity. It is used, I am sure, in the arts, beyond what many of us know.

Mr. CHESTER—I presume it would be a very interesting subject, if time permitted, but it is one that requires some degree of preparation to present to the Society in an instructive form.

I will say that generally, it is used with different devices for controlling automatic machinery—controlling it in the sense that the brain and nerves may control the muscular system; not at a positive force, but as that which governs a positive force. There is hardly a limit to the number of applications which might be devised for applying electricity in this way, in the several branches of manufacturing art.

Mr. CORYELL—Cannot electricity or galvanism be brought to bear in testing the strength of iron and steel? Will not the arrangement of the light and the position of the rays assist in determining the quality of iron and steel?

Mr. CHESTER—Experiments of this kind have been made. The capacity for conducting electricity is an almost positive test of the purity of copper. The same test, or a test of a similar nature, may be applied with very exact results to iron. Experiments have been made, I understand (I do not know how far they have been carried beyond the limit of my own experience), in testing the quality of iron by magnetic impulses.

General Railroad News.

CHICAGO RAILROAD NEWS.

Chicago & Alton.

By the end of the present season this company will have one fourth of its road laid with steel, and it has contracted fo enough to lay another quarter of the road by the end of th next season.

The grain warehouses which will be patronized by this company wil be completed in about a month, when the difficulties which the company has contended against for so long in the transportation of grain will terminate.

The company has just completed large cattle yards both at Bloomington and at Louisiana. The one at Louisiana contains 10 acres, and the one at Bloomington 15 acres. The former is to be used as a resting place for the Kansas and Texas cattle, and the latter for those coming from Missouri. The business of stock transportation with this company has grown into very large proportions.

The company will issue cheap tickets to the St. Louis fair, from points all along the line. The fare from any point to St. Louis and return will be one-fifth more than half fare. The sale of these tickets will begin October 1, and continue to the 11th, and they will be good as late as the 15th.

Chicago, Danville & Vincennes.

This company has changed its time-table, so that passenger trains arrive at 10 a. m. and 3:40 p. m., and leave at 7:50 a. m. and 5:50 p. m. The coal business on this road is rapidly increasing in volume.

Lake Shore & Michigan Southern.

This company will inspect the new road in Michigan, which is completed to Eaton Rapids, and will immediately put it in operation. Probably the formal acceptance of the work will take place this week.

Illinois Central.

The fruit business of this road for the present year has been immense, as will be seen by the figures submitted below. The strawberry train was put on as early as May 22, and withdrawn June 11, and in that period 98 cars, transporting 882,785 pounds of berries, arrived in this city. The peach and regular fruit train was started July 22, and withdrawn September 9, and in that time transported 904 car-loads, or 9,934,191 pounds.

This company's new line to Cincinnati, by way of Kankakee, appears to be a decided success.

Michigan Central.

This company has ordered 30 more locomotives for this year than were included in the estimates some time since; a portion of the engines are already beginning to arrive. The company has erected a large freight house on the eastern section of the old Marine Hospital grounds, this land having been purchased by the company some time ago. The Michigan avenue front will be sold for business purposes.

Chicago & Pacific.

The Northwestern Railway track was cut by this company on Sunday, September 21, that being the only time it could be done without opposition, it was supposed. This company has about half of the line graded from Chicago to Elgin, and has just put an engine and a construction train at work. It expects to lay track, from this date, at the rate of about half a mile per day, until Elgin is reached. The people of Elgin are making a strong effort to induce the company to locate its machine and construction shops at that place. Cars for a passenger train have been ordered and will be put upon the road about the 15th of October.

The Van Buren Street Depot.

The Chicago, Rock Island & Pacific and the Lake Shore & Michigan Southern companies passenger depot on Van Buren street is nearly done, so far as the walls are concerned, and ready for the construction of the roof. It is a much finer building than the one destroyed by the fire. It is built on the same foundation, and, of course, encloses the same space; but instead of a mansard roof the walls are carried higher up, and there are two tiers of windows in the wall. The long-side walls are also broken by two projections not in the old structure, one in the center and one at the south end, which break the surface of the long wall and add much to the effect. The walls are finished more smoothly. The office end, three stories high, which has one of the best positions in the city for a good architectural effect, being just at the head of La Salle street, is nearly as it was in the old building. It will have, however, one newland very good feature—a large clock, which will be illuminated at night, and will give the anxious traveler who approaches the station exact information of the time he has to reach the train.

Chicago & Northwestern.

The grain crop has been for a month and more coming forward very freely, and with 600 more cars than last year the company is still unable to supply the demand. Traffic is considerably complicated by the large shipments into the city of building materials, chiefly bricks and lime, from points within 40 or 50 miles of Chicago. These materials are bulky, cannot be warehoused with the existing facilities, are terribly in the way if unloaded in the yards, and very commonly keep cars out of service for some time after they have arrived, waiting for consignees to unload them.

Chicago, Rock Island & Pacific.

This company has declared a half-yearly dividend of 4 per cent. payable October 23. Transfer books will be closed October 5 and reopened on the 25th.

Green Line.

This company is again ready to do business in Chicago. It receives freight at the Michigan Central freight house, at the foot of South Water street, and has an office at No. 92 Market street, with Mr. T. H. Stewart as agent. Its business is chiefly to Louisville and Cincinnati and intermediate points, going from Chicago over the Michigan Central to Michigan City, and thence by the Louisville, New Albany & Chicago, etc.

ELECTIONS AND APPOINTMENTS.

—Mr. H. M. Smith, for four years past Master of Machinery of the Alabama & Chattanooga Railroad, has accepted a position as Master Mechanic of the Evansville, Henderson & Nashville Division of the St. Louis & Southeastern Railway, having his headquarters at Nashville.

—At the annual meeting of the stockholders of the Flint & Pere Marquette Railroad Company, held at East Saginaw, Mich., September 18, the following board of directors was elected: E. B. Ward, of Detroit; Samuel Farwell, Utica; Jesse Hoyt, New York; John H. Prentiss, Chicago; J. H. Hitchcock, Orange County, N. Y.; H. C. Potter, East Saginaw; G. W. Ledlie, East Saginaw; W. L. Webber, East Saginaw; W. W. Crapo, New Bedford, Mass. The board of directors subsequently chose the following officers: Executive Committee, E. B. Ward, Samuel Farwell, A. C. Potter, W. W. Crapo; President, E. B. Ward; Vice-President, Samuel Farwell; Secretary and Treasurer, H. C. Potter; Assistant Treasurer, L. C. Storrs; Superintendent, Geo. C. Kimball; Auditor and General Ticket Agent, G. W. Ledlie. These officers are all re-elected.

—At a meeting of the stockholders of the Newark, Delaware & Northwestern Railroad Company held at Ottawa, Putnam County, Ohio, September 5, 4,150 shares of stock were represented and the following board of directors was elected: J. C. Evans, Delaware; A. Ream and Gen. J. S. Robinson, Hardin; Jas. L. Birkey, Wm. C. Maholm and Waldo Taylor, Licking; J. L. H. Long, Dr. H. Huber and Dr. H. Day, Putnam. The board of directors completed the organization of the company by electing J. C. Evans, President: J. L. H. Long, Vice-President; Waldo Taylor, Secretary and Chas. T. Dickinson, Treasurer.

—The New York & New Haven Railroad, the New Haven & Hartford Railroad and the Shore Line Railroad from New Haven to New London, will be operated by the New York, New Haven & Hartford Railroad Company, as consolidated from the 1st of October next, with the following officers: William D. Bishop, President, office, New York; W. P. Burrall, Vice-President, office, Hartford; John T. Shelton, Treasurer, office, New York; E. M. Reed, General Superintendent, office, New Haven; John T. Moody, Superintendent New York & New Haven Division, New York; S. H. Scranton, Superintendent Shore Line Division, New Haven; C. S. Davidson, Superintendent Hartford Division, Hartford; E. C. Robinson, Chief Clerk, New York; A. L. Brigham, General Ticket Agent, New York; G. H. Forbes, General Freight Agent, New York; R. N. Dowd, Commissary, New Haven. Of these officers, Messrs. Bishop and Shelton held the same positions in the New York & New Paven Company, Mr. Forbes the same position in the Hartford & New Haven Company, Mr. Burrall was President of the Hartford & New Haven Company, and Mr. Reed Superintendent of that road. Mr. Moody has been Assistant Superintendent of the New York & New Haven road, and Mr. Scranton President of the New Haven & New London Company and Mr. Dowd was Purchasing Agent for the New York & New Haven road.

—Messrs. S. H. Kauffman, of Washington, D. C.; Thomas Underwood, of Lafayette, Ind., and A. C. Sands, of Cincinnati, Ohio, have been appointed Commissioners to examine the Northern Pacific Railroad.

—Mr. John G. Hill has been appointed General Northwestern Passenger Agent of the St. Louis & Southeastern Railway, with headquarters at St. Louis.

—At the annual meeting of the stockholders of the Indianapolis, Bloomington & Western Railway Company, at Champaign, Ill., last week, the following board of directors was chosen: William Walter Phelps and Robert Turner, New York; W. Dennison and B. E. Smith, Columbus, Ohio; S. C. Wilson, Crawfordsville, Ind.; George Nebeker, Covington, Ind.; J. C. Short, Danville, Ill.; C. R. Griggs and W. H. Smith, Urbana, Ill.; W. S. McCord, Farmer City, Ill.; H. Conkling, Bloomington, Ill.; D. T. Thompson, Pekin, Ill.; and L. J. Bond, Monticello, Ill. The board subsequently organized by the choice of B. E. Smith, President; C. R. Griggs, Vice-President; and A. P. Lewis, Secretary and Treasurer. The above are all re-elected, with the exception of Mr. Bond, who takes the place of D. Ricketts, of Indianapolis, in the board of directors.

—At the annual meeting of the Connecticut & Passumpsic Rivers Railroad Company, at Newport, Vt., the following board of directors was elected: Emmons Raymond, Josiah Stickney, P. B. Cheney, Gardner C. Brown, F. M. Weld and Amos Barnes, of Boston; Henry Chase and S. S. Thompson, of Lyndon, Vt.; Elijah Cleveland, of Coventry, Vt.; Horace Fairbanks, of St. Johnsbury, Vt.; T. P. Redfield, of Montpelier, Vt.; Albert Knight, of Stanstead, Can., and Benjamin Pomroy, of Compton, Can. All of these are re-elected except Messrs. Barnes and Thompson, who take the places held by Thomas Upham and William Thomas, of Boston, last year.

—Under the recent reorganization of the Erie Railway, the Eastern Division, extending from Jersey City to Port Jervis, and the Delaware Division, from Port Jervis to Susquehanna, have been united and made one division, and Mr. George S. Redington has been made Division Superintendent. Mr. Redington has for several years been Superintendent of the Delaware Division. The new division, of which Mr. Redington will have charge, with its branches, has 380 miles of track, over most of which the traffic is very heavy. The appointment was to take effect September 25.

—Mr. W. H. Clarke, mentioned recently in these columns as one of the Executive Committee of the Civil Engineers' Club of the Northwest, and then called Chief Engineer of the Illinois Central Railroad, is, instead, Assistant City Engineer of Chicago. The Chief Engineer of the Illinois Central is L. H., not W. H., Clarke.

PERSONAL.

—It is reported that Mr. Giles Merrill, Superintendent of the Vermont Central Railroad, has resigned his position, the resignation to take effect October 1. It is said that important changes are to be made in the management of the road.

TRAFFIC AND EARNINGS.

—The earnings of the Kent County Railroad of Maryland for the six months ending August 31, 1872, were: for mail service, $1,350: miscellaneous freights, passengers, $9,000; transportation of peaches, $13,000; total, $23,350. The receipts from this last source during the entire season, ending September 28, will amount to about $18,000, swelling the gross receipts to about $28,350. The operating expenses during the same time have been (including lease of Townsend Branch) $8,700; interest on bonded debt, $12,000; total $20,700; leaving a surplus of $7,650. The working expenses, it will be seen, are at the extraordinary low rate of 30 per cent. of the earnings, which is more remarkable as the receipts per mile are small—being for the six months at the rate of less than $1,700 per mile per year.

—The earnings of the St. Louis & Southeastern Railway (consolidated) for the second week in September were $21,394, being an increase of $932 over the same week in August.

—The earnings of the Great Western Railway of Canada for the week ending September 6 were: 1872, £23,358; 1871, £21,418; increase, £1,940, or 9 per cent.

—The earnings of the Grand Trunk Railway for the week ending September 7 were: 1872, £38,200; 1871, £34,200; increase, £4,000, or 11¼ per cent.

—The earnings of the Toledo, Wabash & Western Railway for the first week in September were: 1872, $119,644; 1871, $128,702; decrease, $9,058, or 7 per cent.

—The earnings of the Peoria & Rock Island Railway for the month of August were $31,050.93; operating expenses, $16,696.05; net earnings, $14,354.88.

—The earnings of the Kansas Pacific Railway for the second week in September were: From passengers, $21,475.05; from freight, $46,918.99; from mails, $2,710.62; total, $71,104.66. Of

this amount $2,842.62 was for transportation of mails, troops and government freight.

—The passenger earnings of the Union Pacific Railroad for the third week in September were: 1872, $101,897.01; 1871, $88,222.29; increase, $23,674.72, or 30¼ per cent. This is the largest amount that the road has ever earned from passenger travel in the same period.

—The earnings of the Toledo, Wabash & Western Railway for the second week in September were: 1872, $117,713; 1871, $114,613; increase, $3,100, or 2¾ per cent.

—The earnings of the Lake Shore & Michigan Southern Railway for the second week in September were: 1872, $355,457; 1871, $314,949; increase, $40,508, or 12¾ per cent.

THE SCRAP HEAP.

Exemplary Railroad Conductors.

The Jersey City *Journal* says: "Running on the New Jersey Central Railroad, between Jersey City and Easton, are 35 passenger conductors. They work from eight to nine hours per day, and receive from $75 to $110 per month. Covering the walls of two sides of the conductors' room, at the Central ferry, may be seen each of their photographs. A noticeable fact in their history, and one that other roads might profit by, is, that all except two were promoted from some lower position on the road, such as brakeman, baggageman or fireman. Another thing is, that no bonds from these men are required, no 'spotters' are set to watch them, and it is very seldom that an occasion is found on the Central for a conductor's discharge. The oldest conductor on this road is H. A. King. T. C. Little is the fattest, C. H. Robinson is the youngest, and John Gibson the handsomest. Out of the 35 all but ten are married. Four are under 35 years old, and but one is over forty. They all wear the neat regulation uniform furnished by the company. Keep themselves extremely tidy. Are always polite to passengers, and not one ever drinks stronger liquids than tea or coffee!"

American Bridge Company.

This company seems to have no lack of orders. It has recently begun work on a new bridge over the Missouri River at Boonville, Mo., for the Missouri, Kansas & Texas Railway, which will be lower down that troublesome stream than any other bridge except the one at St. Charles. There will be five spans of 250 feet each and a draw span of 362 feet, with, perhaps, some shorter spans. Three are four of these spans will rest on pneumatic piers, which this company has used with so much success in so many large structures.

The company has also recently taken a contract for the construction of a bridge over the Red River, for the Missouri, Kansas & Texas, for which corporation the American Bridge Company has constructed about three miles of bridges—nearly all Post "combination" truss structures, the wood being chiefly members in compression, which can at any time be replaced with iron without change of the iron work.

The bridge company has also been awarded the contract for the construction of a bridge about 1,000 feet long over the Arkansas at Little Rock. This will rest on pneumatic piers throughout. It is just completing the iron trusses for the great iron roof of the passenger depot of the Lake Shore & Michigan Southern and the Chicago, Rock Island & Pacific railroads in Chicago—an important structure, covering a space of more than an acre and a half, and is engaged on some large roofs of an engine house and shops of the Missouri, Kansas & Texas Railway at Parsons, Kan. It has nearly completed the Peoria & Springfield bridge at Peoria, which is a combination bridge with an iron draw of 36 feet span.

Buffalo Union Car Works.

The shops of this company, at Buffalo, N. Y., are about completed, and so much of the machinery is in that work has actually been commenced, and some freight cars have already been turned out. The company was organized about a year ago.

The Waste of Coal.

The Engineer says: "Mr. Siemens, President of the English Institute of Mechanical Engineers, in his annual address at the recent convention of that society, held in Liverpool, asserted that of the total coal raised in England annually, from one-half to two-thirds, which might be practically economized, is now destroyed or dissipated carelessly, and that theoretically the coal consumed has more than ten times the capacity for iron-making and steam production that is now practically realized. As a striking example, he stated that sixty-eight pounds of coal is theoretically enough to bring a ton of iron to the welding heat, and more than enough to melt the same weight of cast-iron, the actual quantity consumed varying from ten to twelve to, perhaps, thirty times as much; in some instances even more.'

"He stated as an encouraging fact—proving that no real obstacles exist, practical or theoretical, to realizing a still vast economy in coal-burning for steam purposes—that within the last nine years the consumption of coal per indicated horse-power has, in marine engines, been reduced by about one-half. In fact, if the average marine engine consumption of nine years ago is compared with the best results at present obtained, the improvement is far greater; for whereas the average was, as nine years ago stated before the institution, 4.5 lbs. of coal per hour per indicated horse-power, at present steamships make long voyages with a consumption not exceeding 2.2 lbs., and some but 1.7 lbs. of coal for the same duty."

OLD AND NEW ROADS.

St. Louis, Kansas City & Northern.

The St. Louis *Times* says of the recent sale of this road under a judgment rendered in the United States courts for $500,000, that when the county stock in the North Missouri road was sold a year ago, it left the company without solid title to a portion of the road in St. Louis. To overcome this trouble and settle all doubts, the judgment was obtained and the sale made, purely as a matter of accommodation to the company.

Cincinnati, Covington & Cumberland Gap.

This Kentucky company was organized September 7 by the election of Col. Turner, of Montgomery County, as President; R. H. Fitzhugh, Vice-President and Engineer. The directors are Chas. Hawes, of Bourbon County; J. G. Pittman, of Powell County; John G. McGuire, of Lee County; Gen. T. T. Garrard, of Clay County; and E. Demortimer, of Cumberland Gap. The officers of the company say that they intend to go to work at once. It is expected that the Atlantic, Mississippi & Ohio Company will advance $1,000,000 toward the construction of the road, that Bourbon County will vote the sum of $500,000, and that other counties on the line will do their share. We are not informed as to how solid the foundation is upon which these expectations are based.

East St. Louis, Cahokia & Falling Springs.

This road, which is now nearly completed, starts from the new stock yards at East St. Louis, runs to a point opposite Carondelet, where connection is made by ferry with the Iron Mountain, Pacific and Atlantic & Pacific roads. One half mile below Cahokia the road branches off toward the bluffs, terminating at Falling Springs, a place of summer resort. The whole length of the road will be 11¼ miles. The officers of the company are John B. Lovingston, President; John B. Bowman, Secretary. Directors—Thomas Winstanley, Alexander Pope, W. C. Hewitt. The contractor for the construction of the road is J. W. Cologue.

Plymouth, Kankakee & Pacific.

It is reported that the contractor for ironing the road has succeeded in negotiating $1,000,000 of the bonds, and that work will be begun very soon, and a considerable part of the road west of Plymouth completed this season.

Southern Pacific of California.

The city council of Los Angeles has resolved to donate to this company the stock now held by the city in the Los Angeles & San Pedro Railroad Company, the amount of which is $150,000.

Louisville & Nashville.

In making application to have its securities placed on call in the New York Stock Exchange, this company has submitted the following statement of its condition:

Organized under charters from the States of Kentucky and Tennessee.

	Miles.	
Length of road—main line from Louisville to Nashville	185	
Bardstown Branch, Ky	17.30	
Knoxville Branch, Tenn	110.32	
Richmond Branch, Ky	33.46	
Memphis Branch (to State line)	46.37	
Line from State Line to Paris, Tennessee, formerly Memphis, Clarksville & Louisville Railroad	83.60	
Total	475.05	
Leased Roads—Glasgow Branch	10.19	
Memphis & Ohio Railroad, from Paris to Memphis, Tenn	130.30	
Nashville & Decatur Railroad, from Nashville, Tenn., to Decatur, Ala	122	
Total length operated	737.54	

In addition to the above this company owns a controlling interest in and is now completing the South & North Alabama Railroad (183 miles), from Decatur to Montgomery, making the total length operated 920.54 miles.

First mortgage 7 per cent. bonds, main stem, dated, July 1, 1858. Due Jan. 1, 1873, 1874, 1875 and 1876. Interest payable January 1 and July 1. Interest payable in New York city. Principal payable in Louisville, Ky. Denomination $1,000 each. Trustee—JOHN L. ASPENWALL.		$554,000
First mortgage 7 per cent. bonds, Memphis branch, dated May 1, 1860. Mature May 1, 1873, 1874 and 1875. Interest payable May 1 and November 1. Principal and interest payable in Louisville. Denomination $1,000 each.		189,000
First mortgage 7 per cent. bonds, Lebanon Branch, dated November 16, 1863. Mature November 16, 1880, 1885. Interest payable May 16 and November 16. Principal and interest payable in Louisville, secured by joint mortgage to City of Louisville. Denomination $1,000 each.		88,000
City of Louisville 6 per cent. bonds, account of Lebanon Branch, dated June 2, 1856. Mature 1886. Interest payable June 2 and December 2. Principal and interest payable in New York City. Denomination $1,000 each.		225,000
City of Louisville 6 per cent. bonds, Lebanon Branch Extension, dated October 15, 1863. Mature October 15, 1893. Interest payable April 15 and October 15. Principal and interest payable in Louisville. Denomination $1,000 each.		333,000
Consolidated 7 per cent. mortgage bonds, dated April 1, 1868. Mature April 1, 1898. Interest payable April 1 and October 1. Principal and interest payable in New York City. Denomination $1,000. Numbered from 1 to 8,000.		
Issued	$6,647,000	
Unissued	1,353,000	
		8,000,000
Capital stock, shares $100 each		8,980,600
Total		$18,319,600

Earnings as per last annual report per year ending June 30, 1871:

Memphis, Clarksville & Louisville, gross	$462,570 83
Memphis & Ohio	924,207 20
Louisville & Nashville	3,153,006 90
Total	$4,539,784 93

Officers—H. D. Newcomb, President; Thomas J. Martin, Vice-President; Albert Fink, Second Vice-President.

Burlington, Cedar Rapids & Minnesota.

A correspondent of the Burlington (Iowa) *Hawkeye* says that the new branch running west from Vinton, 125 miles, north of Burlington, is nearly completed to Traer, near Buckingham, in Tama County, a distance of about 25 miles from Vinton, and trains will probably be running by November 1.

Chicago, Clinton & Dubuque.

The survey for the extension of this road has reached Le Claire, and is being pushed rapidly forward toward Davenport. The superstructure of the bridge across Elk River, between Sabula and Lyons, 51 miles south of Dubuque, has arrived and will be put up and ready for the rails within a week.

Missouri, Kansas & Texas.

A Parsons, Kan., dispatch to the St. Louis *Republican*, dated September 20, says: "Yesterday a train of sixteen cars of cattle from Red River City or Denison, as the new city at the terminus of the road in Texas is called, passed through Parsons, under contract to be landed in St. Louis in five days from time of starting. They had to drive two days out of the five; also a rest of twelve hours at Schell City. This road, during the last fifteen days of this month, has shipped 499 car-loads of cattle, 375 car-loads of coal, 170 car-loads of material for the Atchison, Topeka & Santa Fe Railroad, and about 300 cars of merchandise for Texas. Emigration to Texas is increasing rapidly. Eight trains pass this place daily, averaging eighteen cars per train. To-night the track is within 23 miles of Red River. This road will ship 30,000 bales of cotton into St. Louis this year."

Chicago & Paducah.

Work on this road has been going on rapidly for some weeks, and iron will soon be laid south from Fairbury.

New Indiana Railroad.

Articles of incorporation have been filed for the formation of a company to build a railroad from Carbon, on the Indianapolis & St. Louis Railroad 53 miles west of Indianapolis, northwest to Otter Creek in Parke County, thence southwest down Otter Creek, rejoining the Indianapolis & St. Louis road at Lodi, five miles west of Carbon. The road will be eight miles long and is designed to tap the coal region in Otter Creek Valley.

Colorado Central.

The surveyors of the line to Julesburg have the line located from Golden to near Boulder, and the first 10 miles of grading is contracted for. Contracts are to be let as fast as the line is located.

New Orleans & Meridian.

Enterprise, Miss., has voted to issue $100,000 in city bonds, bearing 8 per cent. interest and payable in 30 years, in aid of the construction of this road.

Kansas Pacific.

It is proposed to extend the branch now being constructed from Kit Carson to Fort Lyon, from Fort Lyon to Pueblo, and at a meeting held at Pueblo, General Carr offered, on behalf of the company, to build the extension, provided Pueblo would vote $300,000 towards it. The amount offered by that place is $200,000, with land for depot buildings, &c., and right of way.

Distances from Mobile.

The Mobile *Register* gives the distances by railroad from Mobile to Louisville and St. Louis, making them exactly the same, as follows:

MOBILE TO ST. LOUIS.

Mobile & Ohio	miles. 472
St. Louis & Iron Mountain	" 196
Total	" 668

MOBILE TO LOUISVILLE.

Mobile & Montgomery	miles. 178
South & North Alabama	" 183
Nashville & Decatur	" 122
Louisville & Nashville	" 185
Total	" 668

Central of New Jersey.

In a circular issued to the stockholders of this company and those of the Delaware, Lackawana & Western, offering $5,000,000 of Central of New Jersey convertible bonds for their subscription previous to October 1, the following statement is made:

"This issue of bonds is mainly for the purpose of providing funds for continuing the enlargement to the sources and avenues of coal supply, as also to increase and develop the passenger and freight facilities. A large, growing and profitable business calls for a steady increase in facilities of all kinds; but the largest demands arise from the policy adopted and acted on during the last two years, of securing permanently the coal lands and roads from which our main business is to be derived.

"A full annual report was made to January last. Since then the following expenditures have been made:

General construction, new track, etc	$368,500
Reducing grade Newark Branch	40,500
Coal wharf, Port Johnston	34,500
New shops, houses, etc	20,580
Engines, $170,000; cars, $507,000	677,000
Coal interest	1,203,000
Newark Railroad stock redeemed	121,750
Perth Amboy and Long Branch railways	196,000
Docks, wharves and filling	346,000
Lands	237,000
Total	$3,246,750

"There have been received for instalments on the scrip stock $3,252,850; leaving, September 1, about $600,000 still to receive.

"The following is a statement of the receipts and expenses for nine months to October 1, the last month being estimated:

Passengers		$1,038,000 00
Merchandise		1,375 000 00
Coal		2,854,000 00
Miscellaneous		72,000 00
Total		$5,339,000 00
Operating expenses		3,168,000 00
		$2,171,000 00
Dividends six months	$846,868 85	
Interest nine months	469,000 00	
Taxes nine months	49,000 00	
Rent Lehigh & Susquehanna Railroad, nine months	617,000 00	
		1,981,865 85
		$189,131 15
October dividend		450,000 00
Deficit		$360,868 85

which is nearly covered by the surplus of last year. Any change for the better in the coal trade would at once operate most beneficially on the finances.

"The bonds are offered to the stockholders in the proportion of one bond of $1,000 for every 66 2-3 shares held, and for each fraction of that amount. The privilege will be open till the 1st of October, proximo. For stockholders at a distance a sufficient time for communication will be allowed. Ten per cent. will be payable on or before the 1st of October next, to Samuel Knox, Treasurer, and 10 per cent. on or before the first day of each succeeding month, till the whole amount has been paid in. Payment may be made in full, if desired. Interest to the 1st of November, the date of the bond, will be adjusted at the time of payment."

Boston, Barre & Gardner.

Engineers have begun the permanent location of the extension from Gardner, Mass, to Winchendon, and the company advertises for proposals for the construction of the extension, which will be about seven miles long.

Massachusetts Central.

The company has decided on the location of the road in West Boylston and the work on the grading, which has been stopped for several weeks, is to be resumed.

Portland & Ogdensburg.

The Boston *Advertiser*, of September 24, says: "The loan of the city of Portland to the Portland & Ogdensburg Railroad, together with the bonds of the Vermont portion of the road to Lake Champlain, will probably be taken by a German house. The whole amount will be about $2,000,000."

Haverhill & Shaw's Crossing.

The survey of the proposed new railroad from Haverhill to Shaw's Crossing, in Andover, Mass., thence to connect with the Essex road, has just been completed. The line starts from a point in Bradford near the bridge, passing through the town, thence west of Chadwick's Pond. The route is represented to be favorable and easy of construction. The line will be about six miles long, and would connect with the Lawrence Branch of the Eastern Railroad.

Montrose.

The Allentown (Pa.) *News* of September 24 says:

"The Lehigh Valley Railroad Company have purchased rails and ties for the whole road from Tunkhannock to Montrose, and have already expended $70,000 in purchase for the Montrose Railroad. The work of grading is progressing rapidly."

Atlantic & Pacific of California.

A San Francisco telegram, dated September 23, says:

"The Board of Supervisors to-night indefinitely postponed consideration of a modified order submitting to popular vote the proposition of a city subscription of $10,000,000 to the California Atlantic & Pacific Railroad. This scheme did not involve an absolute subsidy. It proposed a full equivalent for the aid granted in preferred stock of the company, to be held in trust for the city's benefit by fifty well-known citizens, until such time as it could be safely and surely transferred to the city government, or until it could be sold and its proceeds applied to cancelation of $10,000,000 subsidy bonds. Fifteen thousand citizens, being a decided majority of the voting population, have petitioned the supervisors for opportunity to have this question passed upon by the people at the polls, but their request was denied. The board, however, finally passed the order submitting to the people the competing project for an absolute subsidy of $10,000,000, to be given outright to the San Francisco & Colorado Railroad Company, who offer no

equivalent in stock or bonds. It has no chance of success at the polls should the Mayor not veto it, as is thought probable. Senator Cole addressed an audience of several thousand persons to-night on the railroad question, earnestly opposing any further subsidies, directly or indirectly, for the benefit of the Central Pacific Railroad Company."

Philadelphia & Reading.

The Manayunk *Star* says that a new branch line is proposed through Roxborough. "The line as surveyed branches off from the Norristown branch where said branch crosses the Reading coal road and takes a direct course on an ascending grade, crossing the Wissahickon valley just above where the Old Log Cabin used to stand. The plan of the crossing of the Wissahickon is made out, and the structure, when erected, will be one of the finest of the kind in the country. It is to be of stone, and to be constructed with double arches, one above the other, so as to prevent any vibration. The height of this bridge would be one hundred and thirty feet from the Wissahickon. The road then continues up near to and just east of the Ridge road to Barren Hill. To build this will cost a million of dollars, and if one-half this amount was taken by the people in stock, the Reading Railroad Company would build the road."

Green Bay & Mississippi Canal.

A Washington telegram of September 24 says: "Philetus Sawyer, member of Congress from Wisconsin, and B. J. Stevens, attorney for the Green Bay and Mississippi Canal Company, were at the War Department to-day to consummate the purchase by the Government of the locks, canals, dams and franchises of that company in the work, better known as the Fox & Wisconsin Rivers Improvement. The amount voted by Congress last winter for its purchase was to-day paid to the company and the property duly conveyed by deed to the United States. The entire work has this day been passed over to the United States Engineer Department, to carry out the enlargement and completion of this national highway from the West to the East."

Warren & Venango.

The Titusville (Pa.) *Herald* says; "The Warren & Venango Railroad cannot be said to be dragging its slow length along, albeit they have been pestered and hindered by injunctions and appeals, because it has surmounted such obstacles, and now bids fair, in the course of four or five weeks, to be in running order from Warren to Titusville. In view of the consummation of this enterprise, a few items will not be out of season. The entire distance of this new road is 35 miles, and starting from Warren it passes through the following towns and stations, with the following distances reckoned from Warren: Irvineton, 6 miles; Pittsfield, 12 miles; Garland, 15 miles; Pleasant Valley, which is at the summit, 20 miles; thence to Titusville, 35 miles. The route from Warren lies down the Allegheny River, up the Brokenstraw to Garland, thence up Mulingar, to the Summit, thence down Cadwell and Pine Creek to Titusville. There is no ascending grade north to exceed 26 feet to the mile, the average grade not averaging ten feet to the mile. The track is now laid from Warren to Tionesta, and trains are running over that portion of the road daily. The balance of grading, bridging and masonry will be completed in ten days, and the road in running order early in October, unless the weather is more unpropitious than is anticipated. When this connection is made through trains will be run from Pittsburgh to Buffalo, *via* Titusville, in the space of ten hours, Titusville being about halfway between Pittsburgh and Buffalo. The distance fromPittsburgh to Titusville is 149 miles, and from Titusville to Buffalo, 144 miles."

Chicago & Rock River.

This railroad's junction with the Chicago & Iowa is at Shabbona Grove, De Kalb County, 30 miles west of Aurora.

Wisconsin Valley.

Judge Power, President of this company, reports that the grading and bridging on the 46 miles of the road now being built are finished and everything is ready for the tracklayers.

Wisconsin Central.

The Ashland (Wis.) *Press* says of the work on the northern end of the line:

"Another engine and several cars will arrive soon to assist in the construction of the road. It is also expected that several thousand tons of railroad iron will be received this fall. The iron for the bridge is mostly here, and as soon as the abutments are finished the iron superstructure will be placed in position. It is doubtful whether the cars will reach the gap by winter, but every effort is being made to push the work along. The construction train now runs out nearly to the White River crossing."

Chicago & Northern Pacific Air Line.

The Jefferson (Wis.) *Banner* says: "The news relative to our new line of railroad is that the contract has been let to a New York firm by the name of Kauffman & Co., and that work will be commenced immediately. Mr Ruger, the Engineer, has been ordered to commence the survey from the State line to Chicago at once.

Fort Dodge & Northwestern.

This company filed its articles of incorporation in the office of the Secretary of State of Iowa, September 8. The corporation is created "for the purpose of constructing, owning and operating roads, railroads, bridges, ferries and ferry-boats, store-houses, ware-houses and elevators in the State of Iowa, and buying selling, owning and trading in lands and other property in said State." The principal place of business will until otherwise ordered be at Emmettsburg, Palo Alto County. The object is to construct a railroad "from a point at or near Fort Dodge; thence in a northwesterly direction up and along the Des Moines River to the north line of the State, and thence in a northwesterly direction to some point on the Northern Pacific Railroad." The capital stock is to be $3,000,000, and the names of the incorporators are John F. Duncombe, President; Lindsay Seals, Secretary, and O. E. Palmer, Treasurer. Mr. Duncombe is an officer in the Illinois Central Railroad Company.

Cumberland & Ohio.

The Louisville *Courier-Journal* gives the following information concerning the contracts for the construction of this road:

"Messrs. Meyer & Hay stipulate to take the county and mortgage bonds of the company in payment, and to construct, iron and equip the road from a point on the Short-line to Greensburg, 107 miles, at a cash cost of less than $26,000 per mile, and to complete the whole within two years from January 1, 1873. The work to be done and materials supplied embrace the 'graduation, masonry, bridge superstructure, iron rails, joint fastentings, spikes, cross-ties, cattle-guards, road-crossings, track-laying, two miles of side track, three turn-tables, six water-tanks, four locomotives, four passenger, two baggage, thirty box, ten rack, twenty flat and ten hand cars, and the payment of all engineering expenses,' to be done under the superintendence of the company's Chief Engineer, in first-class style. Payment is to be made monthly, as the work progresses, on the estimates of the Chief Engineer. Messrs. Meyer & Hay are to continue the work of graduation and masonry on the road-bed from Greensburg to the Tennessee State line. The section of 24 miles of road-bed from the State line to Gallatin, Tenn., the company has let for construction to McCann & Brother, of Louisville, and J. C. Rodmur, of Gallatin, Tenn., at prices below the engineer's estimate. Thus the work of construction will soon be prosecuted on 200 miles of the route, from the Short-line to Gallatin. The section from Gallatin to Nashville, 26 miles, the company hold open for the present, two or three propositions being before them for the extension south of Gallatin.

"The final locating surveys have been completed on all of this 200 miles excepting a section between Greensburg and Glasgow, which will be shortly worked up. These surveys have developed information accurate and sufficient enough to satisfy the company that the road-bed complete, including bridges and masonry, will be about $13,000 per mile."

The road is intended to run from a point on the Louisville, Cincinnati & Lexington Railroad near Louisville, south through Greensburg, Ky., and Gallatin, Tenn., to Nashville. It would be a competing line with the Louisville & Nashville road for travel between those points, but for most of the distance the two roads would be a considerable distance apart. The two lines will be of about the same length.

West Amesbury Branch.

This railroad, which extends from West Amesbury, Mass., west to the line of the Boston & Maine Railroad at Newton, N. H., a distance of five miles, is nearly completed and will soon be ready for acceptance by the Boston & Maine Company, which has agreed to lease the road and pay 5 per cent. interest on the cost. The whole cost of the road, including stations and fences, will be $114,000.

Terre Haute & Southwestern.

The Terre Haute (Ind.) *Express* says that Mr. D. C. Jackson, the contractor on this road, will begin work immediately. The piles for the bridge at Chenoweth's Ferry are to be put down at once, and it is hoped that the piers will be completed before the winter rise in the Wabash.

Athol & Enfield.

It is reported that the Vermont Central Company has offered to lease this road for ten years, paying 7 per cent. interest.

Montpelier & Wells River.

Tracklaying is to be further postponed, on account of the present high price of iron.

Burlington & Southwestern.

This road is now completed to Caldwell Station, 110 miles from Burlington, and 10 miles from Moulton on the St. Louis, Kansas City & Northern road, to which point the Burlington & Southwestern trains have been running. On the Lexington & Kansas City Division trains have commenced running from Laclede, Mo., on the Hannibal & St. Joseph road, north to Linneus, about six miles. The gap between the two ends of the road is being rapidly closed.

Dubuque Bridge.

About noon of September 20, a small house used as a tool house on the draw of the bridge over the Mississippi, at Dubuque, took fire, as is supposed from sparks from the chimney of a tow-boat, and the fire spread rapidly among the timbers of the drawpier. Several streams of water were quickly brought to bear upon the fire, and it was extinguished with comparatively slight damage.

Detroit & Bay City.

This road was completed to Log Pail Station in Oakland County, September 12, and was expected to reach Orion, in the same county, by September 21. Orion is about 35 miles from Detroit, and nearly due north from that city.

Baltimore & Drum Point.

The directors of this company have determined to commence the construction of the road from Camp Parole, near Annapolis, to Butler's Tavern, a distance of about 12 miles. This section will be built this fall, and in the spring it is expected that the road will be extended south through Anne Arundel into Calvert County. The road will pass through a section entirely destitute of railroads, although no part of it is far from navigable water.

South & North Alabama.

A telegram announces that the last rail on this road was laid September 15, completing the closing of the gap of 33 miles, from Birmingham to Blount Springs, between the northern and southern ends of the road. The road extends from Montgomery, Ala., to Decatur, about 183 miles.

Georgia Western.

Work has been commenced on this road, and a large force is at work clearing and preparing for the graders, near Atlanta. Work has also commenced on the piers for the Chattahoochee bridge.

Waco & Northwestern.

This branch of the Houston & Texas Central road is completed to Waco, 38 miles from Bremont, the junction with the main line, and four miles from the late terminus.

Warren & Jefferson.

This projected railroad is to run from Warren, Pa., south about 60 miles into the coal fields of Jefferson County. It is expected to do an extensive business in carrying coal to Buffalo and other points in Western New York.

New York & Oswego Midland.

The Utica *Herald* says that this company will not open its line through to New York until next spring.

California Pacific.

The Vallejo, or California Pacific, route from Sacramento to San Francisco, which has been closed since the road was damaged by freshets last fall, has finally been re-opened, the damages having been repaired. Trains commenced running September 16.

Dividends.

The Chicago, Rock Island & Pacific pays a half-yearly dividend of 4 per cent. October 23.

The Lehigh Valley announces its regular quarterly dividend of 2½ per cent., payable October 15.

The Central of New Jersey will pay its regular quarterly dividend of 2½ per cent., contrary to a generally credited rumor.

Oregon & California.

The financial agents of this company, Messrs. Drexel, Morgan & Co., announce that they will pay the coupons of the bonds due October 1 on and after that date, which is the most practical of answers to the reports that the company is bankrupt.

Connecticut & Passumpsic Rivers.

The annual report of this company gives the gross earnings for last year as $812,797.79, and the expenses $503,895.87, or 62 per cent., leaving the net earnings $308,901.92. The gross earnings the previous year were $695,617.02, the expenses $412,351.82, and the net earnings $283,265.20, showing for last year an increase of $117,180.77, or 16½ per cent. in gross earnings, an increase of $91,544.05, or 22¼ per cent. in expenses, and an increase of $25,636.72, or 9 per cent. in net earnings. The report says that the road was originally built to make a through line from Boston to Montreal by connecting with the Stanstead, Sheffield & Chambly road at the Canada line, but that road never having been completed, and having passed into the hands of parties whose interests would not incline them to connect with the Passumpsic road, negotiations were entered into which resulted in the building of the Massawippi Valley Railway giving the Passumpsic road a connection with the Grand Trunk Railway at Lennoxville, and making a short and direct route to Quebec and Eastern Canada. With a view to complete the long contemplated line to Montreal, the directors have, as authorized by a resolution passed at the stockholder's annual meeting last year, made a contract with the Missisquoi & Clyde Rivers Railway Company, by which $350,000 is to be loaned to that company, to enable it to complete its road from Newport, Vt., to Richford, where it will connect with the Southeastern Counties Junction Railway, now in operation from Richford to West Farnham. When this connection is made, it will complete a continuous and direct route to Montreal, over the Passumpsic road. This amount of $350,000 is raised by issuing notes of the Connecticut & Passumpsic Rivers Company, payable in ten years from July 1, 1871, and bearing interest at 7 per cent. A portion of these notes has been negotiated and $90,000 paid over as the work progressed, agreeably to the contract.

Missisquoi & Clyde Rivers.

The iron is arriving and tracklaying has commenced from Newport, Vermont. Four miles from Newport toward Troy are ready for the rails, and the grading is well advanced over nearly the whole line. The whole length of the line from Newport to Richford is about 25 miles.

Utica & Black River.

The track is being laid on the extension from Carthage, N. Y., to Clayton, on the St. Lawrence, 15 miles below Cape Vincent, and it is expected that the road will be completed to Theresa, in Jefferson County, a distance of 25 miles, by November. From Theresa to Clayton, 16 miles, the grading and masonry are well advanced, and are to be finished this fall, and the iron will be laid next spring.

Sioux City & Pembina.

Writing from Sioux City, Iowa, September 20, a correspondent says: "George Douglass, of the well known contracting firm of Douglass, Brown, Reynolds & Co., who have a contract for grading the first one hundred miles of the Sioux City & Pembina Railroad, was in this city yesterday, and in company with several members of the board of directors visited the work now in the hands of the Dakota Southern road between this city and the point where the roads diverge. Mr. Douglass will at once sublet twenty miles of grading, to be completed this fall, commencing at the point of divergence and running directly north up the Sioux River, making a section of 25 miles, which will be ready for the iron before snow flies."

Baltimore & Potomac.

The line between the temporary depot in Baltimore and Washington, which has been open for traffic since July 2, is laid with rails weighing 64 pounds per yard, is thoroughly ballasted and equipped with the best class of engines and cars. The plans for the grand depot in Washington have been completed, and the work will soon be put under contract. Indeed, work on the foundation has been begun. The building for the offices, waiting rooms, etc., will be 92 by 120 feet, while the car building will be 550 by 120 feet, of iron, and very much like the Grand Central Depot in New York in design.

The Baltimore tunnel, which is to unite this road with the lines northward from Baltimore, and for the first time provide a route by which cars may run through that city without delay, is progressing finely. More than 2,000 feet of arch have been laid within four months past, leaving about 2,200 feet to complete. All of the work outside of the portion drifted will be completed by January. In the drifted section the work is pushed night and day at four points, and the 700 feet remaining is to completed early in 1873. The difficulty of working through a troublesome material is increased by the contracted space in which the work is done—a street only 66 feet wide.

American Fork.

The track is laid for about half the length of this Utah narrow-gauge road, but small-pox having broken out in the cañon, hands were fast leaving about the middle of this month.

Utah Southern.

On the 16th, a Salt Lake City correspondent informs us, trains were running about 25 miles on this road and track-laying was progressing. One fill was finished about the 1st inst. of 250 or 260 feet high and about 500 yards long at the top. Directly after it is a cut about 60 feet deep and thence the course is down into the other (Utah) valley.

Utah Northern.

A Utah correspondent writes that on the 16th inst. the company was running two round trips daily over the 24 miles of the road completed, and that it was waiting to cross a fill 82 feet deep which was to be ready by the end of the month. The company now has an elegant passenger car with the Miller platform made at the Jackson & Sharp Works.

Long Island Central.

This road, known as A. T. Stewart's railroad, was to have been opened to Hempstead Plains on the 16th, but some of the work being found defective, the opening was postponed.

Indianapolis, Bloomington & Western.

The new extension (formerly the Havana, Mason City, Lincoln & Eastern road) has been completed from the starting point at White Heath, 13 miles west of Urbana, on the Monticello road, to Clinton, a distance of about 27 miles. At Clinton the road crosses the Illinois Central and the Gilman, Clinton & Spirngfield roads.

Colorado Railroads.

Hon. William Bross, writing from Colorado to the Chicago *Tribune* under date of September 4, says:

"The Kansas Pacific and the Denver Pacific, connecting with the Union Pacific at Cheyenne, furnish two direct lines to the Missouri River, and, of course, to all parts of the country. The Boulder Valley Railroad connects Denver with the immense coal fields of the Boulder Valley, and, therefore, supplies an unlimited amount of fuel to the city. The Colorado Central, of the usual gauge, connects Denver with the Golden City, 17 miles; and thence, up the valley of Clear Creek, it is a three-foot road. It is finished to within four miles of the forks of Clear Creek, and will be done to Central City before the 1st of January. Better still, General T. E. Sickles, Superintendent of the Union Pacific, which company owns the Colorado Central, has just received orders from Boston to put the line under contract from Julesburg to Golden City, 200 miles. It is all to be completed within a year. This will give Colorado two competing lines to the East, and, of course, it will greatly promote the prosperity of the Territory. The Denver & Rio Grande, three-foot gauge road, is now running south to Pueblo, on the Arkansas, 125 miles, and is doing a successful business. For a sparsely-settled and mountainous country, this gauge is exactly the thing; for it affords every needed accommodation to business: and, what is better, it pays. In a couple of months it will be finished to Canon City, where are immense beds of coal and iron. This is only a branch, some 50 miles long. Two hundred miles, reaching far into the San Luis Park, are soon to be put under contract, to be finished within the year. The City of Mexico, 2,400 miles from Denver, is the objective point of the road. Governor Hunt, with a small party of engineers, made a preliminary reconnoisance over the whole line last winter, and they report the route highly favorable and the business sure to be abundant and remunerative. What is better, the German capitalists, who have been over the road this summer,

have promised the funds to build it as fast as they can be used in the economical construction of the road. It will be a proud day, especially for our distracted Sister-Republic, when our railway system has direct connection with the 'Halls of Montezumas.' Governor Evans and other parties are making a survey for a narrow-gauge road up the Valley of the Platte to Fairplay and the silver mines of Mount Lincoln, and there can be little doubt that it will be built within the next two or three years."

Southern Minnesota.

Great excitement exists among the farmers on the line of this road with regard to the supposed monopoly of the wheat trade along the road by Mr. J. C. Easton. Mr. Easton has even been burned in effigy, and has barely escaped personal violence.

Indianapolis, Delphi & Chicago.

This company, which is formed to complete the construction of a road which was attempted a few years ago by a company of the same name but afterward abandoned, filed its articles of incorporation with the Secretary of State at Indianapolis, September 11. The road runs in a northwesterly direction from Indianapolis through the counties of Hamilton, Boone, Clinton, Carroll, White, Jasper, Newton and Lake to a point on the State line not yet fixed, a distance of about 140 miles. The capital stock is to be $2,500,000, and the directors are: Robert S. Dwiggins, Joshua Healey, Wm. Haywood, James C. Reynolds, Joshua Rothrock, Abner H. Bowen, Charles Angell, Milton R. Graham, James H. Stewart, Vincent Holt, H. G. Morrison, A. Holcraft and L. McCoy.

Green Bay & Lake Pepin.

The Clark County (Wis.) *Republican* says that this company has contracted with L. G. Merrill for a bridge across Black River, 14 miles south of Neillsville. This would indicate that the company intended to adopt a route so far south of that village as to forfeit the $100,000 voted by the county on condition that the road should pass within five miles of Neillsville.

Northern Michigan.

The Detroit *Tribune* says: 'Captain Craw has for several months been working in the interests of a railroad from Grand Haven, by way of Fruitport, to East Saginaw, to be known as the Northern Michigan. He has just returned from the East, and thinks he has induced Eastern capitalists to invest enough in it to complete it. Contractors have offered to build and equip the first division, from Grand Haven to Stanton, by June 1, 1873. It is proposed that it shall pass through the counties of Ottawa, Muskegon, Kent, Montcalm, Gratiot and Saginaw."

Oil City Inclined Railroad.

Oil City is in a very narrow valley, with very steep and high hills on each side. The hills are very desirable for residences, but very hard to climb. Citizens have purchased one of the most attractive of them, laid out 300 acres into lots, and constructed a railroad at an inclination of 16 degrees and 1,600 feet long to carry people between their homes and their places of business.

Monmouth County Agricultural.

The Trenton (N. J.) *State Gazette* says that work has been stopped on this road between Keyport and Freehold. At the recent election no distinction was made between paid and unpaid stock, and the non-payers succeeded in electing a board of directors who are not in favor of pushing the work.

Williamstown.

Work is being pushed forward on this road, which extends from Williamstown in Camden County, N. J., nearly due west, to a junction with the West Jersey Railroad at Glassboro, a distance of about seven miles. The company has valuable wharf property at Pennsgrove, on the Delaware, about 25 miles below Philadelphia, and it is said that they intend to extend the road from Glassboro by way of Woodstown, to Pennsgrove, as soon as possible. From Glassboro to Pennsgrove by this route, which is somewhat circuitous, the distance is about 22 miles.

Carolina Narrow Gauge.

This company, which proposes to build a narrow-gauge railroad about 60 miles in length from Chester, S. C., north to Lincolnton, N. C., was organized at a meeting of the subscribers to the stock, held at Lincolnton, N. C., August 27. A. H. Davega, of Chester, S. C., was chosen President, with the following board of directors: B. F. Wheeley, Yorkville, S. C.; J. T. Smyer, Gaston, N. C.; W. D. Metz, Lincolnton, N. C., and G. A. Ford, Catawba, N. C. Chester is at the junction of the King's Mountain Railroad with the Charlotte, Columbia & Augusta road, and Lincolnton is on the Wilmington, Charlotte & Rutherford road, 30 miles northwest of Charlotte. The southern portion of the line would be very near the King's Mountain Railroad.

Southern Pacific of California.

The branch line from Gilroy to Castroville, near the mouth of the Salinas River, is nearly completed, construction trains running to within three miles of Castroville.

Berks County.

Engineers have been at work locating the road in the vicinity of the terminus at Slatington, preparatory to letting the contracts. The road will make connections with both the Lehigh Valley and the Lehigh & Susquehanna roads at Slatington. The branch to the Lehigh & Susquehanna road will diverge from the original line a short distance above the village of Slatington, and cross the Lehigh Valley road on a bridge.

Milwaukee & St. Paul.

This company had some land condemned for its use in Chicago, for which the occupiers, who had a boiler shop on the ground, were awarded damages—so much for the ground, so much for building, so much for removing tools, and a variable sum for damages in interruption of business, etc., in this way: if they remained in possession three months, they were to receive no damages under this head, as they would then be able to remove at their leisure; if two months, the award was $1,600; and if one month only, $3,200. The company, not needing the ground immediately, did not take possession, but the owners brought suit in the Circuit Court of Cook County, asking for an order for the company to show cause why it should not pay the largest amount awarded, as the owners had decided to remove immediately and not wait for the company to demand possession. This extraordinary demand, however, was not supported by the court.

Oregon Central.

This road is completed about ten miles beyond Cornelius, the late terminus, to the bridge over the Tualatin, on the borders of Yamhill County, and about 20 miles from Portland. The bridge over the Tualatin is finished, and the grading is nearly completed some 14 miles beyond that river, and tracklaying has begun.

Buffalo, New York & Philadelphia.

The Emporium (Pa.) *Independent* says: "Work on this road is progressing rapidly. Workmen are now here preparing for track laying. The Cleveland Bridge Company, who have the contract for building the bridges on this side of the Summit, have a force of some twenty men here getting out and framing timber for their structures; and the Messrs. Napier Brothers, who have the contract for all the stone work of the entire line in this State, have completed their work on the other side of the Summit, and have concentrated their force on this side, and from their well-known energy it may be reasonably expected that their entire work will be completed within the next two months."

LOCOMOTIVE RETURNS, MAY, 1872.

Master Mechanics of all American railroads are invited to send us their monthly reports for this table.

Name of Road.	Number of miles operated	Number of Locomotives in service	Mileage. Passenger	Freight	Miscellaneous	Total	No. of Miles run to Ton of Coal	Cord of Wood	Pint of Oil	Cost per Mile, in Cents. Repairs	Fuel	Stores	Miscellaneous	Engineers, firemen and wipers	Total	Average Cost of Coal, per ton	Wood, per cord	Oil, per gallon
																$	$	$
Burlington & Missouri River	..	65	53,936	82,486	45,010	182,432	39.42	54.24	14.53	5.05	8.85	0.79	..	7.63	22.32	3.50	3.40	..
Cleveland & Pittsburgh	..	76	..	..	..	202,486	57.76	..	18.49	7.53	4.77	0.73	..	7.32	20.35	2.25	1.85	..
Clev., Col., Cin. & Indianapolis	397	119	53,033	211,559	91,924	356,516	44.62	..	20.95	4.24	7.47	0.62	..	6.92	19.25	3.35	..	..
Chicago, Rk. Island & Pacific (Ill. Div.)	..	73	39,635	143,682	6,131	189,418	45.07	..	19.29	3.37	5.94	0.49	..	6.72	16.52	3.11	..	..
" " " " (Iowa Div.)	..	103	73,690	153,415	42,871	269,976	46.64	..	15.74	3.9	6.51	0.56	..	6.92	17.97	2.75	4.00	..
Chicago, Burlington & Quincy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chicago & Northwestern	..	253	180,267	269,695	142,602	592,554	35.37	..	..	8.31	11.34	0.91	..	8.28	29.34	3.50	4.75	..
Cincinnati, Lafayette & Chicago	..	5	3,570	6,065	4,665	14,300	59.18	..	14.24	1.87	7.56	0.57	..	7.57	17.57	3.94	..	..
Erie Railway (Eastern Division)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Flint & Pere Marquette	..	33	31,314	30,735	15,511	77,460	..	52.33	24.50	3.68	8.60	0.78	..	7.11	19.57	..	4.25	..
Hannibal & St. Joseph	..	71	46,627	82,145	28,750	157,522	59.40	..	21.00	7.50	5.56	0.90	..	7.40	21.30	3.50	5.00	..
Illinois Central (Chicago Division)	252.50	65	30,093	84,717	43,718	168,528	40.66	..	12.44	7.57	5.10	0.69	..	6.58	20.22	1.90	4.30	0.50
" " " (South D vision)	250.75	33	31,019	48,301	10,569	89,889	43.43	..	12.48	10.99	4.72	0.71	..	6.61	23.03	1.90	4.30	0.50
" " " (North Division)	225	42	28,369	69,705	13,369	110,443	35.84	..	11.18	9.20	5.63	0.77	..	6.52	22.12	1.90	4.30	0.50
" " " (Iowa Division)	401	37	27,637	52,733	14,062	94,432	37.09	..	21.39	7.35	7.06	0.56	..	6.40	21.37	2.50	5.50	0.50
Kansas Pacific	..	..	70,100	98,740	63,040	231,880	48.63	..	16.09	5.54	8.44	0.51	..	5.93	20.42	4.00	4.83	..
" " (Den. Pac. & Den. & Boulder)	..	..	7,930	4,220	3,930	16,080	53.76	..	20.83	0.79	6.58	0.44	..	7.15	14.87	..	..	..
Lake Shore & Mich. Sou. (Buffalo Div.)*	..	84	28,300	131,400	56,436	216,120	53.10	..	20.70	5.40	6.50	..	..	6.10	18.00	3.50	3.50	..
" " " " (Erie Div.)*	..	90	30,682	148,357	49,313	228,346	45.00	38.00	16.00	5.33	7.93	..	..	7.10	20.36	3.50	4.00	..
" " " " (Toledo Div.)*	..	76	32,860	138,760	32,330	203,950	48.42	69.48	15.13	5.13	7.65	..	..	6.85	19.63	4.00	4.00	..
" " " " (Mi. So. Div.)*	..	163	118,444	228,557	164,875	512,376	73.58	40.80	31.02	5.02	8.41	..	..	7.56	18.99	4.85	5.85	..
Louisville & Nashville	..	78	58,850	93,953	6,894	157,697	..	..	12.39	7.40	12.49	0.75	0.73	9.16	30.53	2.10	3.50	0.33
" " (Mem'a, Clk's & L. Div.)	..	7	1,344	9,441	2,100	12,885	..	22.29	10.00	19.09	11.88	0.88	0.82	10½	43.33	..	2.65	0.48
" " (Memphis & Ohio Div.)	..	19	32,370	14,011	5,044	41,425	..	33.00	13.10	10.23	9.09	0.66	1.08	9.26	30.32	..	3.00	0.48
Leavenworth, Lawrence & Galveston	..	17	17,813	18,355	5,575	41,743	78.61	..	27.86	3.08	6.64	0.48	..	7.75	17.35	4.00	4.00	..
Missouri River, Fort Scott & Gulf	..	18	21,653	15,236	13,500	49,389	77.60	..	31.50	6.63	3.36	0.42	..	7.91	18.32	2.49	4.00	..
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Pennsylvania (New York Division)	..	96	110,398	79,543	4,727	194,666	35.90	42.02	8.73	7.40	15.10	1.20	..	..	23.70	20c.	5.04	..
" (Amboy Division)	..	55	47,231	57,002	44,34[illegible]	108,581	50.63	56.49	16.34	8.20	10.20	0.90	..	..	19.30	"	5.04	..
" (Belvidere Division)	..	30	16,411	34,223	3,45[illegible]	54,090	40.45	48.51	16.67	4.40	13.00	1.30	..	..	18.70	"	5.04	..
" (Philadelphia Division)	..	128	71,378	240,007	12,110	323,495	33.31	..	19.45	6.30	5.70	0.80	..	..	12.80	6c.	3.60	..
" (Middle Division)	..	117	56,900	261,426	11,14[illegible]	331,469	30.84	..	24.15	5.70	5.00	0.70	..	..	12.30	"	3.60	..
" (Pittsburg Div., Ft. End.)	..	73	10,010	141,996	4,442	156,268	25.00	..	12.85	7.40	7.20	1.10	..	..	15.70	"	3.60	..
" (Pittsburg Div., W. End.)	..	149	64,240	102,669	14,270	261,170	35.07	..	16.54	7.90	7.50	1.60	..	..	17.00	"	3.60	..
" (Tyrone Division)	..	27	11,565	35,886	2,466	49,917	29.65	..	26.33	8.90	6.40	0.70	..	..	16.00	"	3.60	..
" (West Penn'a Div.)	..	21	16,860	28,579	3,931	48,420	45.27	..	36.50	2.90	4.10	0.50	..	..	7.50	"	3.60	..
" (Lewistown Division)	..	6	7,305	4,995	1,288	13,588	60.26	..	24.54	6.10	3.10	0.70	..	..	9.90	"	3.60	..
Pittsb., Cin. & St. Louis (L. Miami Div.)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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Pittsburgh, Ft. Wayne & Chic. (E. Div.)	319.20	146	85,976	313,691	10,230	409,347	44.70	..	15.21	4.29	6.17	0.86	1.19	7.20	19.71	..	..	..
" " (W. Div.)	280	96	83,401	197,954	20,738	307,083	114.20	23.40	17.35	4.00	10.30	0.50	..	6.90	21.70	2.50	3.35	..
Rome, Watertown & Ogdensburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
St. Louis, Kansas City & Northern	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Carolina	..	36	15,216	36,281	10,310	61,807	..	45.57	37.62	5.97	5.23	0.32	..	..	12.02	..	2.38	..

* Switch Engines allowed six miles per hour.

Marginal Road at Portland, Me.

The city government of Portland, Me., has appropriated $45,000 to complete the marginal way from Gould's Wharf to the Grand Trunk Railway bridge, provided the Portland & Rochester Railroad and Back Bay Land companies give a bond to the city guaranteeing to finish the road at their own expense if the sum named is not sufficient, and that all roads using the way shall pay such sums as the city sees fit.

Coal Depot at New Bedford.

It is reported that one of the leading Pennsylvania coal companies, in conjunction with the New Bedford & Taunton Railroad Company, is about to establish a very large coal depot at New Bedford, where coal will be transshipped to points in the interior of New England.

Carbondale.

One mile of track has been laid southward from Lawrence, Kansas, and the work is going forward rapidly.

St. Louis & Iron Mountain.

The track on the Arkansas Branch has been laid to Neeley's Swamp, 15 miles south of Poplar Bluff, the late terminus. Neeley's Swamp is only nine miles from the State line, where the junction with the Cairo & Fulton Railroad will be made, and it is expected that this nine miles will be completed by October 1.

Painesville, Youngstown & Pittsburgh.

The construction of the remainder of this narrow-gauge railroad has been commenced. The contract for grading and masonry from Youngstown northwest to Farmington, about 30 miles, has been let to Cook, Kneass & Co., of New York, and a large force is to be put on at once between Youngstown and Warren. The business of the completed section, from Painesville to Chardon, continues to increase, and four new locomotives have been added to the equipment.

Kent County Railroad.

The entire line of this Maryland road, from Belle Air, Md., northeast, to Townsend, Del., a distance of 34 miles, was opened for through business some months since. The earnings during the past six months ($28,350 gross, and $19,650 net) have fully satisfied the friends and projectors of the enterprise of the ability of the road not only to earn all its expenses, but to pay handsome dividends to the stockholders.

From parties interested in the property and familiar with its operations we have the following information:

"The earnings have steadily and rapidly increased. Early in the year additional equipment was provided, which it was thought would fully meet the requirements of the road. Extra freight and passenger trains were put on, but with the increased facilities came larger increase of traffic, and it has been found necessary to lease from the Philadelphia, Wilmington & Baltimore Railroad additional cars, in order to carry the large number of passengers and amount of fright offering. The section of country through which the road runs is famous for its peach orchards. It is estimated that 1,800,000 bushels have been sent to the Philadelphia and northern markets over the Delaware Railroad and its feeders during the past season. The receipts of the Kent County Railroad, from this source alone, have been about $18,000, all of which is clear profit, the receipts from miscellaneous freights and passengers during the same time having paid all expenses.

"The oyster product of Chesapeake Bay amounts to about 300,000 tons annually. A large proportion of this goes to the markets of Philadelphia and New York. The Kent County Railroad forms an important link in the shortest and most direct route from the Chesapeake to these markets, and the company confidently anticipate a large income from this source.

"The transportation of grain will also constitute a large item in the revenues of the company. The lands of Kent County are more fertile and will average more in price than any others in the State. There is scarcely a better grain-growing district in the United States. In the Baltimore market, where the grain is well known, it is more sought after and brings better prices than any other variety.

"At Townsend, Del., connection is made with the Delaware Railroad, and get this road and the Philadelphia, Wilmington and Baltimore Railroad, with Philadelphia and the North.

"Within the next year the southwestern extension of the road, from Belle Air to Rock Hall, Md., will be built, giving the road direct communication with the Chesapeake, and tapping the immense trade which finds its outlet through that bay to the markets of Baltimore, Philadelphia and New York, and opening the quickest and shortest route between Baltimore and the central portions of Delaware and Maryland."

Bellaire, Woodsfield & Zanesville.

The surveying parties at work on the proposed line of this road have reached the Noble County line, having commenced the survey in Summit Township.

Columbus & Toledo.

The work of raising subscriptions along the two proposed lines of this road is nearly finished, and in a very short time the company will be able to decide which route will offer the greatest inducements. Blanchard township, in Hardin County, has voted $30,000 in bonds to the road, and promises $85,000 additional. Center township, in Lucas County, has also voted aid.

Marietta & Pittsburgh

Canal Dover has offered the company $40,000, provided the round house and machine shops are located at that place.

Zanesville, Cumberland & Caldwell.

The contract for the construction of that part of the road which is to be built by the city of Zanesville is being prepared, and work will shortly be commenced.

Scioto Valley.

An offer having been made by parties in Huntington to equip and run this railroad, provided the counties build the roadbed, the Cleveland, Columbus, Cincinnati & Indianapolis Company has made a similar offer. It is not yet known what arrangements will be made.

New York & Chicago Air Line.

The surveyed line for this road runs through the towns of Litchfield, York, Medina, Montville and Sharon, in Medina County, Ohio, and it is proposed that the people in the towns vote the required amount under the Boesel law, as the quickest method of building the road.

Western North Carolina.

Suit has been brought in Iredell County, N. C., to foreclose the mortgages on this road.

Port Royal.

The construction of this road is now progressing rapidly. Regular train service has been extended to Allendale, 60 miles from Beaufort and 12 miles beyond Hoover's, the late terminus. Three new locomotives and a number of cars have been added to the equipment. The bridge across the Savannah River, it is expected, will be completed by October 15. A cargo of 1,300 tons of iron has arrived at Port Royal, and tracklaying will be pushed forward without delay.

Rochester & State Line.

The general contractors have sublet the section of 35 miles from the north line of the town of Warsaw, Wyoming County, N. Y., southwest to the Cattaraugus County line, to William McRae & Co., of Lockport, N. Y. The Salamanca Division of 28 miles has also been sublet, and the contractors are already on the ground. Work on the grading is to be continued all winter.

Buffalo & Jamestown.

Messrs. Moulton & Russell, the general contractors, have sublet the first section of 20 miles, from Buffalo to the Cattaraugus Creek at Gowanda, to Drew & Youngs of Coldwater, Mich.

Philadelphia & Reading.

On the morning of September 20 this company commenced to lay tracks on Front street in Reading, along the line of the West Reading Railroad. The work, however, was stopped by an injunction obtained on the suit of the Berks County Railroad Company. The case will be settled by the courts.

The Harrisburg *State Journal* says that all the conductors on the road are to be required to wear a uniform.

New York & Long Branch.

This road is under contract as far as Red Bank. The section of seven miles from Red Bank to Long Branch will be put under contract as soon as the stock is taken.